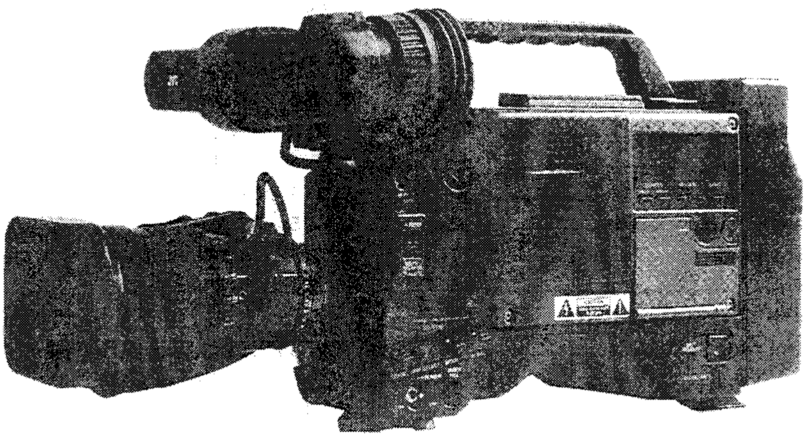
No. 60052

JVC Service Manual



MODEL GY-X1TCE/GY-X1E

VICTOR COMPANY OF JAPAN, LIMITED

TABLE OF CONTENTS

CAMERA HEAD SECTION

Important Safety Precautions
INSTRUCTIONS

Section Title Page

1. CIRCUIT DESCRIPTION 1-1
1.1 COLOR SEPARATION PRISM 1-1
1.2 CCD 1-1
1.2 IMAGE SENSOR BLOCK 1-2
  1.3.1 ISR, ISG, ISB, boards 1-2
  1.3.2 DR2 board 1-3
  1.3.3 DR1 board 1-4
1.4 PR1, PR2BOARDS 1-4
  1.4.1 Black clamping circuit(PR1 board) 1-4
  1.4.2 High sens. circuit(PR2 board) 1-4
  1.4.3 Dynamic shading correction circuit (PR2 board) 1-4
  1.4.4 Gain control circuit(PR2 board) 1-5
  1.4.5 NAM circuit(PR1 board) 1-5
  1.4.6 Newly developed processing IC(PR1 board) ... 1-5
  1.4.7 ABL circuit 1-6
  1.4.8 Data conversion circuit 1-6
1.5 SECC BOARD 1-7
  1.5.1 Encoder section 1-7
  1.5.2 Contour signal generator 1-8
  1.5.3 SSG section 1-9
1.6 CP BOARD 1-10
  1.6.1 Main hardwares and thier functions 1-10
  1.6.2 Control of camera section 1-11
  1.6.3 Auto iris control 1-11
  1.6.4 Auto white control 1-13
  1.6.5 Auto black control circuit 1-13
1.7 PS BOARD 1-14
1.8 RF1/RF2 BOARD(TC version only) 1-14
1.9 IF BOARD(VTR SECTION) 1-15
  1.9.1 Audio circuit 1-15
  1.9.2 Camera-VTR interface circuit 1-15
  1.9.3 Video signal interface circuit 1-15

2. DISASSEMBLY 2-1
2.1 FUSE REPLACEMENT 2-1
2.2 REMOVAL OF COVERS 2-1
  2.2.1 Right side cover 2-1
  2.2.2 Left side cover 2-1
  2.2.3 Rear cover 2-2
  2.2.4 Top frame 2-2
2.3 REMOVAL OF SWITCH BOX AND CONNECTOR BOX 2-3
  2.3.1 Switch box(in right front part) 2-3
  2.3.2 Connenctor box(in left front part) 2-3
  2.3.3 Connector box(in left rear part) 2-4
  2.3.4 Battery box(in right rear part) 2-4
2.4 REMOVAL OF MAIN BOARDS 2-5
  2.4.1 PR board 2-6
  2.4.2 SECC board 2-6
  2.4.3 CP, LD, FC boards 2-6
  2.4.4 TC board(GY-X1TC only) 2-7
  2.4.5 PS1/PS2 boards 2-7
  2.4.6 MT1 board 2-7
  2.4.7 MT2 board 2-8
  2.4.8 OP board 2-8
  2.4.9 RF1/RF2 boards 2-8
2.5 REPLACEMENT OF MICROPHONE 2-8
2.6 REPLACEMENT OF CLOCK BATTERY 2-9
2.7 OPTICAL BLOCK 2-9
  2.7.1 Removal of optical block 2-9
  2.7.2 Removal of boards 2-10
  2.7.3 Replacement of CCD assembly 2-10
2.8 REMOVAL OF VTR ASSEMBLY 2-11
2.9 INTERNAL SWITCH FUNCTIONS OF CAMERA 2-11
  2.9.1 Switches of TC board(GY-X1TC only) 2-11
  2.9.2 Switches of RF board(GY-X1TC only) 2-12
  2.9.3 Switches of IF board(VTR section) 2-12
  2.9.4 Switch of CP board 2-12
2.10 CPU SERVICE MODE 2-13
  2.10.1 To set to CPU service mode 2-13
  2.10.2 Usage of ADJUST MENU 2-13
  2.10.3 "1.PROCESS" 2-13
  2.10.4 "2.AUTO WHITE/IRIS" 2-14
  2.10.5 "3.AUTO BLACK" 2-14
  2.10.6 "4.ENVIRONMENT" 2-14
  2.10.7 "5.VTR DIAG" 2-14

3. ELECTRICAL ADJUSTMENT 3-1
3.1 FLOWCHART OF ELECTRICAL ADJUSTMENT 3-1
  3.1.1 Adjustment of power supply voltage 3-1
  3.1.2 Adjustment of encoder 3-1
  3.1.3 Adjustment of SSG (Reference signal generator) 3-1
  3.1.4 Adjustment of signals 3-1
3.2 REQUIRED EQUIPMENT AND STANDARD SETUP FOR ELECTRICAL ADJUSTMENT 3-2
  3.2.1 Necessary equipment 3-2
  3.2.2 Required devices 3-2
  3.2.3 Standard setup 3-2
  3.2.4 VIDEO OUTPUT connector(only in GY-X1) 3-3
3.3 ADJUSTMENT OF POWER SUPPLY (PS) VOLTAGES 3-4
3.4 ENCODER ADJUSTMENT-1 (Adjustment of composite signal) 3-5
3.5 ENCODER ADJUSTMENT-2 (Adjustment of Y/C signal) 3-7
3.6 BLACK BALANCE ADJUSTMENT 3-8
3.7 IN-GAIN ADJUSTMENT(Setting of input signal) 3-9
3.8 ADJUSTMENT OF VIDEO OUTPUT LEVEL AND BLACK 3-11
3.9 ADJUSTMENT OF 18 dB TRACKING, KNEE SLOPE, WHITE CLIP 3-15

Section Title Page

3.10 AUTO CIRCUIT(Adjustment of auto iris, auto white and auto black controls) 3-18
3.11 ADJUSTMENT OF CONTOUR CORRECTOR 3-20
3.12 ADJUSTMENT OF VIDEO LEVEL INDICATOR 3-22
3.13 ADJUSTMENT OF AUDIO LEVEL INDICATOR 3-23
3.14 ADJUSTMENT OF SSG (Adjustment of internal sync.siganl) 3-24
3.15 ADJUSTMENT OF SSG (Adjustment of external genlocking)-GY-X1 only 3-24
3.16 ADJUSTMENT OF CCD DRIVER 3-25
3.17 ADJUSTMENT OF AEQ REFERENCE SIGNAL 3-27
3.18 ADJUSTMENT OF TC BOARD 3-28
3.19 INTIAL SWITCH SETTING AT SHIPMENT 3-28
3.20 CAUTION FOR OVERHAULING 3-28

4. REPACKING 4-1
4.1 GY-X1TC/GY-X1 REPACKING 4-1

5. EXPLODED VIEW AND PARTS LIST 5-1
5.1 STANDARD PART NUMBER CODING 5-1
  5.1.1 Screw coding 5-1
5.2 CAMERA HEAD SECTION ASSEMBLY 5-2
5.3 FLAT CABLE ASSEMBLY 5-8

6. CHARTS AND DIAGRAMS 6-1
6.1 SCHEMATIC DIAGRAM NOTES 6-1
6.2 REPLACING SUBMINIATURE "CHIP" PARTS 6-1
6.3 INDEX TO MAIN CIRCUIT BOARDS 6-1
6.4 ISB/ISG/ISR CIRCUIT BOARDS 6-2
6.5 ISB/ISG/ISR BOARDS SCHEMATIC DIAGRAM 6-3
6.6 DR1/DR2 CIRCUIT BOARDS 6-4
6.7 DR1/DR2/FL BOARD SCHEMATIC DIAGRAM 6-5
6.8 PR1/PR2 SIRCUIT BOARDS 6-6
6.9 PR1/PR2 BOARDS SCHEMATIC DIAGRAM 6-7
6.10 SECC BOAED CBMs 6-8
6.11 SECC CIRCUIT BOARDS 6-9
6.12 SECC BOARD SCHEMATIC DIAGRAM 6-10
6.13 RF CIRCUIT BOARD 6-11
6.14 RF BOARD SCHEMATIC DIAGRAM 6-12
6.15 CP BOARD CBM 6-12
6.16 CP/FC CIRCUIT BOARDS 6-13
6.17 CP/FC/SW3 BOARDS SCHEMATIC DIAGRAM 6-14
6.18 TC CIRCUIT BOARD 6-15
6.19 TC BOARD SCHEMATIC DIAGRAM 6-16
6.20 PS1/PS2 CIRCUIT BOARDS 6-17
6.21 PS1/PS2 BOARDS SCHMATIC DIAGRAM 6-18
6.22 LD/OP CIRCUIT BOARDS 6-19
6.23 LD/OP BOARDS SCHEMATIC DIAGRAM 6-19
6.24 MT1/MT2/SWITCHES CONNECTORS CIRCUIT BOARD 6-19
6.25 MT1/MT2/SWITCHES CONNECTORS BOARD SCHEMATIC DIAGRAM 6-20

Section Title Page

6.26 OVERALL WIRINGS 6-21
6.27 BLOCK DIAGRAMS OF PRINCIPLE ICs 6-22

7. ELECTRICAL PARTS LIST 7-1
7.1 ISB board assembly 7-2
7.2 ISG board assembly 7-2
7.3 ISR board assembly 7-3
7.4 DR1 board assembly 7-3
7.5 DR2 board assembly 7-4
7.6 PT1 board assembly 7-5
7.7 PR2 board assembly 7-10
7.8 SECC board assenbly 7-12
7.9 RF1 board assembly 7-19
7.10 RF2 board assembly 7-20
7.11 CP board assembly 7-20
7.12 FC board assembly 7-24
7.13 TC board assembly 7-24
7.14 PS1 board assembly 7-26
7.15 PS2 board assembly 7-26
7.16 MT1 board assembly 7-27
7.17 MT2 board assembly 7-28
7.18 SW5 board assembly 7-28

TABLE OF CONTENTS

VTR ASSEMBLY SECTION

Section Title Page

1. **DISASSEMBLY** 1-1
1.1 REMOVING OF MAIN BOARDS 1-1
1.2 POWER SUPPLY 1-2
1.3 VIDEO, AUDIO, CONTROL SIGNAL INPUT 1-2
1.4 EXTERNAL VIDEO SIGNAL INPUT 1-2

2. **MECHANICAL ADJUSTMENT** 2-1
2.1 PRECAUTION 2-1
2.2 REQUIRED TEST EQUIPMENT AND TOOLS 2-1
2.3 LOCATION OF MAIN PARTS 2-2
2.4 STANDARD MAINTENANCE/INSPECTION SCHEDULE OF MAIN COMPONENT PARTS 2-3
2.5 REPLACEMENT OF MAIN PARTS 2-4
  2.5.1 Removing and replacing cassette housing 2-4
  2.5.2 Manual setting of cassette housing to Eject mode 2-5
  2.5.3 Removing of tension band and supply reel disk 2-5
  2.5.4 Removing of A/C head 2-5
  2.5.5 Removing of center pulley 2-6
  2.5.6 Removing of loading motor 2-6
  2.5.7 Removing of loading gear assy 2-6
  2.5.8 Removing of drum assy 2-7
  2.5.9 Removing of brush 2-7
  2.5.10 Removing of control cam 2-7
  2.5.11 Setting the mechanism to Loading mode without cassette tape 2-7
  2.5.12 Removing of the pinch roller arm assy 2-8
  2.5.13 Removing of capstan motor 2-8
  2.5.14 Removing of take-up clutch 2-8
2.6 MECHANISM PHASE CHECKUP AND ADJUSTMENT 2-9
  2.6.1 Phase adjustment of loading ring and loading idler gear 2-9
  2.6.2 Position of control cam 2-9
  2.6.3 Phase of loading gear assy and control cam ...2-9
  2.6.4 Correlative position of toggle lever and cancel lever 2-9
  2.6.5 Position of timing belt 2-9
  2.6.6 Terms to set eject gear assy..........................2-9
2.7 REGULATOR CIRCUIT 2-10
2.8 TAPE TRANSPORT MECHANISM(Interchangeability and Servo Adjustment) 2-11

3. **ELECTRICAL ADJUSTMENTS** 3-1
3.1 PRECAUTIONS 3-1
3.2 REQUIRED TEST INSTRUMENTS AND TOOLS 3-1
  3.2.1 Contents of alignment tapes 3-2
  3.2.2 Signals necessary for video system adjustment 3-2
3.3 AUDIO CIRCUIT 3-3
3.4 VIDEO CIRCUIT 3-5

Section Title Page

4. **DIAGRAMS AND CIRCUIT BOARDS** 4-1
4.1 GENERAL INFORMATIONS 4-1
  4.1.1 Connections 4-1
  4.1.2 Indication of signal flow 4-1
4.2 REPLACING SUBMINIATURE "CHIP"PARTS 4-1
4.3 KEY TO ABBREVIATIONS 4-4
4.4 LEST OF SEMICONDUCTORS WITH SHAPES 4-6
4.5 INDEX TO MAIN CIRCUIT BOARDS 4-8
4.6 Y/C BOARDS BLOCK DIAGRAM 4-9
4.7 AUDIO BOARD BLOCK DIAGRAM 4-10
4.8 SENSOR, LED, PROT/EP AND REC CTL BOARD LOCATION 4-11
4.9 S/S BOARD SCHEMATIC DIAGRAM 4-12
4.10 S/S BOARD SCHEMATIC DIAGRAM 4-13
4.11 S/S BOARD PARTS LOCATION 4-14
4.12 Y/C BOARD SCHEMATIC DIAGRAM 4-16
4.13 Y/C BOARD PARTS LOCATION 4-18
4.14 AUDIO BOARD SCHEMATIC DIAGRAM 4-20
4.15 AUDIO BOARD PARTS LOCATION 4-21
4.16 PREAMP BOARD SCHEMATIC DIAGRAM 4-22
4.17 PREAMP BOARD & UPPER DRUM BOARD PARTS LOCATIONS 4-23
4.18 IF BOARD SCHEMATIC DIAGRAM 4-24
4.19 IF BOARD PARTS LOCATION 4-25
4.20 OVERALL WIRING DIAGRAM 4-26

5. **EXPLODED VIEWS AND PARTS LIST** 5-1
5.1 VTR ASSEMBLY 5-1
5.2 CASSES ASSEMBLY 5-2
5.3 MAIN ASSEMBLY (1)...5-4

6. **ELECTRICAL PARTS LIST** 6-1
6.1 S/S board assembly 6-2
6.2 Y/C board assembly 6-4
6.3 AUDIO board assembly 6-9
6.4 PRE AMP board assembly 6-11
6.5 IF board assembly 6-12
6.6 UPPER DRUM board assembly 6-14
6.7 SENSOR board assembly 6-14
6.8 LED board assembly 6-14

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

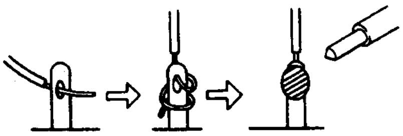


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

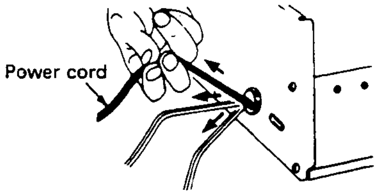


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

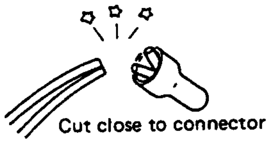


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

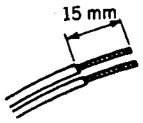


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

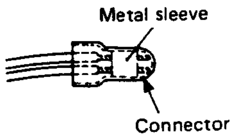


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

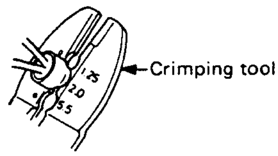


Fig. 6

(5) Check the four points noted in Fig. 7.

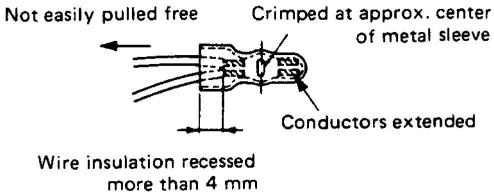

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

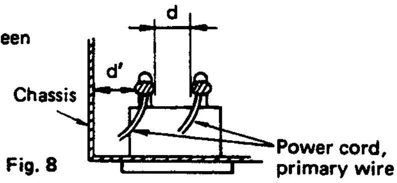


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

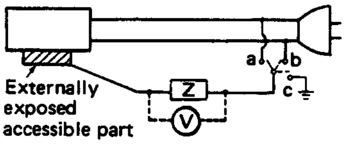


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

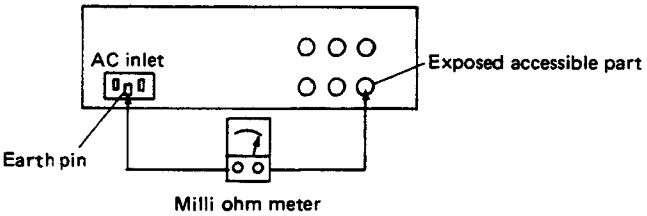


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

JVC Instructions

3-CCD COLOUR VICEO CAMERA WITH S-VHS-C RECORDER

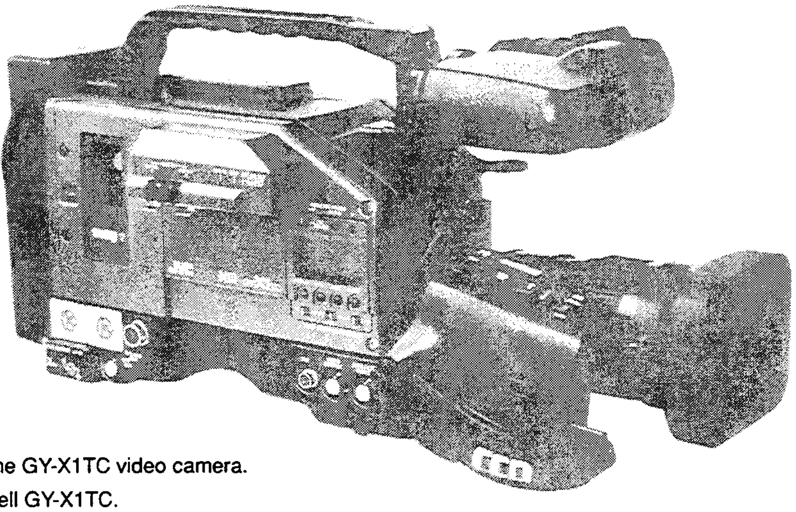
GY-X1TC

(With built-in time code generator)

GY-X1

(Standard type)

BEDIENUNGSANLEITUNG: 3-CCD-FARB-VIDEOKAMERA MIT INTEGRIERTEM S-VHS-C-REKORDER
MANUEL D'INSTURCTIONS: CAMERA VIDEO COULEUR A 3CCD AVEC MAGNETOSCOPE S-VHS-C



The photograph shows the GY-X1TC video camera.
Die Abbildung zeigt Modell GY-X1TC.
La photo montre la caméra vidéo GY-X1TC.

The instructions are given in three languages:
English from page 1 to 52
German from page 53 to 104
French from page 105 to 156

Bedienungsanleitung in drei Sprachen:
English: Seite 1 bis 52
Deutsch: Seite 53 bis 104
Franzosisch: Seite 105 bis 156

Les explications techniques sont données en trois langues:
Anglais, pages 1 á 52
Allemand, pages 53 á 104
Français, pages 105 á 156

POWER SYSTEM
This colour video camera should be used with 12 V DC only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use other than specified power source.

WARNINGS

Due to design modifications, data given in this instruction book are subject to possible change without prior notice.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

LITHIUM BATTERY REPLACEMENT MARKING
REPLACE BATTERY WITH JVC (OR PANASONIC) CR 2025. USE OF ANOTHER BATTERY MAY PRESENT A RISK OF FIRE OR EXPLOSION.

LITHIUM BATTERY DISPOSAL MARKING
WARNING – THE BATTERY USED IN THIS DEVICE MAY PRESENT A FIRE OR CHEMICAL BURN HAZARD IF MISUSED. DO NOT RECHARGE, DISASSEMBLE, HEAT ABOVE 100°C (212°F) OR INCINERATE.
DISPOSE OF USED BATTERY PROMPTLY.
KEEP AWAY FROM CHILDREN.
DO NOT DISASSEMBLE AND DO NOT DISPOSE OF IN FIRE.

Thank you for purchasing the JVC GY-X1TC/GY-X1 Colour Video Camera.

To gain maximum benefit from the camera, it is suggested that you study this booklet carefully. After reading, retain it for future reference.

CONTENTS

Features 3
Precautions 3

System Configuration

Standard Configuration 4

Controls, Indicators, and Connectors

Camera head front right-hand section 5
Camera head rear right-hand section 7
Camera head front left-hand section 9
Camera head rear left-hand section 11
VTR display panel 12
Viewfinder VF-P115 13
Zoom lens HZ-714 14
Battery holder BH-P10 14

Preparations

Attaching the VF-P115 viewfinder 15
Attaching the HZ-714 zoom lens 15
Attaching the BH-P10 battery holder 16
Mounting on the tripod
(using the KA-500X tripod base) 16
Video cassettes 17
Connecting an external microphone 17

Power Supply

Using the NB-G1 (JVC)
or NP-1A (SONY) battery pack 18
Using the AA-P250 AC power adapter 18

Adjustments

Before making adjustments 19
Adjusting the back focus 19
Adjusting the white balance and black balance 20

Important Functions

White balance mode setting
and while balance memories 21
Full-time auto white 21
Sensitivity setting 22
Video ALC (Automatic Level Control) 22
Auto iris and APB function 22
Warning functions 23

Shooting Operation

Normal shooting 24
Quick recording 26
Audio level checking and setting 27
Checking the playback picture 28
Tracking control 28
Remaining tape time display 29
Retake function by Edit Search 29

Special Functions

Auto equalizer (AEQ) reference signal (GY-X1TC only) 30
Electronic shutter 30
Video level indication 30
Title display 30
Status display 31

Memory Function

List of menus, sub-menus and parameters 32
Reading a scene file 33
Storing a scene file 34
Setting a title 35
Set up (Setting camera's functions and parameters) 36
Self-Diagnostic Functions 42
Switching the character output
from VIDEO/VTR OUT on/off 44

Advanced Memory System (AMS) 45
Preset scene files 46

Using as a Studio Camera

Connection to an external VTR and audio equipment 47
Genlocking (GY-X1TC only) 47

Time Code Recording (GY-X1TC only)

Setting the user's bits 48
Time data setting 48
Recording time codes 49

Remote Control Using The RM-LP80 (GY-X1TC only) 50
Replacing the Clock Backup Battery 51
Specifications 52

FEATURES

- A 3-CCD camera delivering professional-quality pictures, with a built-in S-VHS recorder. Even with its viewfinder and lens it weighs approx. 12 lbs (5.5 kg) (GY-X1), the lightest in its category.
- Three high-sensitivity 1/2-inch CCD elements, each with 390,000 pixels. The pictures have professional quality with an S/N ratio of 56 dB and a horizontal resolution of 600 lines, while smear has been reduced to a minimum.
- JVC's new "Advanced Memory System" uses an IC card to set data, for instantaneous response in a variety of conditions.
- The built-in S-VHS recorder is equipped with color playback circuitry and has composite and Y/C (Y/C 443) separate output terminals.
- S-VHS recording circuitry is used which extends the carrier frequency up to 7 MHz, delivering over 400 TV lines of recorded information.
- In addition to the linear audio track, this camera records two channels of Hi-Fi FM audio for extremly high-fidelity sound.
- A full-sized head drum with two rotary erase heads assures the highest possible performance and distortion-free edits.
- Rugged integrated construction with newly-designed diecast aluminum body and a low center of gravity withstand violent motion.
- Quick record mode, with video/audio ALC and full-time auto white circuit activated with a single touch of a button.
- Intelligent auto iris system detects the most appropriate weighting ratio in any condition.
- Internal focusing system permits the use of a rectangular hood. As the hood does not rotate, ghosts and flare are much less than with a round hood. (HZ-714)
- Newly-developed viewfinder VF-P115 with a horizontal resolution of 500 lines.
- Dual-memory auto white system, with the added convenience of being interlocked with the filter setting.
- Built-in compact speaker for a voice-alarm.
- ALC circuit maintains the F-stop memorized in advanced memory system in order to keep depth of field.
- The audio level is indicated in the viewfinder.
- Title generator for titles of up to 16 alphanumeric and special characters.
- A compact high-performance microphone is incorporated, with additional XLR (for 2 channels) and 6-pin mike connectors.
- Battery holder for standard NB-G1 battery.
- Retake function with edit searching for easy checking of recordings at normal speed.
- Electronic shutter with speeds of 1/120, 1/250, 1/500 and 1/1000 second.

Features provided only on GY-X1TC

- Internal VITC generator records time code in the vertical interval. This makes possible frame accurate editing in post production.
- A built-in reference signal qenerator adds a signal with which the auto equalizer in the BR-S611/BR-S811 can automatically correct the playback frequency characteristics.
- Built-in genlock circuit for system synchronization.
- For convenience, a local remote control unit (optional RM-LP80) can be connected.
- With its dual output system, the camera output can be connected directly to an external recorder.

PRECAUTIONS

Safety Precautions

- Use only the optional NB-G1 (with BH-P10) Battery Pack or the optional AA-P250 AC Power Adapter.
- Do not modify the unit or operate it without cover panel to prevent danger.
- When there is any abnormality (abnormal noise, smell, smoke, etc.) with the unit, immediately turn the power off and contact your nearest JVC-authorized service agent.
- Do not damage or fray the power cord. Otherwise, this will cause leakage or electrical shock.
- If the camera is not going to be used for an extended period of time, leave the power cord disconnected for reasons of safety.
- If there is a danger of being struck by lightning during outdoor shooting, evacuate to a safe place immediately.

Handling Precautions

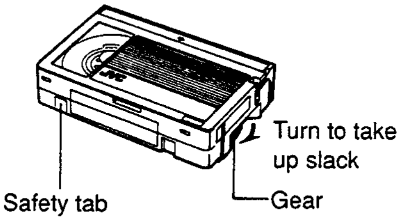
- Supply voltage
  Make sure that the power is between 11.5 V and 15 V DC. If the power voltage is too low, abnormal colour and increased noise could occur. Do not exceed 15 V DC in any case, or the unit could be damaged.
- Ambient temperature
  Do not operate the camera outside a 0°C to +40°C (32°F to 104°F) temperature range. Refer to the corresponding item in the "Specifications" on page 52.
- Where there are strong electromagnetic waves or magnetism, for example near a radio or TV transmitter, transformer, motor, etc., the picture may contain noise and the colours may be incorrect.
- When a wireless microphone or wireless microphone tuner is used near the camera, the tuner could pick up noise.
  In such a case, select another channel.
- Cleaning the body: Wipe body with a dry, soft cloth (such as cheesecloth). When it is extremely dirty, soak the cloth in a solution of neutral detergent, wring it out and then wipe.
  To prevent deformation of the body, etc. and to avoid operation hazards, do not allow volatile liquids such as benzine and thinner to touch the body, and do not wipe it with a cloth soaked in such a liquid.
  If the equipment is soiled with water, oil, solvent, etc., wipe over with soft cloth or cotton first, then clean with gauze, etc. soaked in denatured alcohol.
- Influence of vibrations
  When tapes are played back in a place subject to excessive vibrations, colour pictures may not be obtained.

Moisture condensation prevents use of the unit.

- You have observed that pouring a cold liquid into a glass will cause drops of water to form on the glass's outer surface. This same phenomenon occurs on the head drum of a video recorder when the recorder is moved from a cool place to a warm place, after heating in a cold room, under extremely humid conditions or in a place directly subjected to the cool air from an air conditioner.
- Moisture on the head drum can cause severe damage to the video tape, and can lead to internal damage to the recorder itself.
- If moisture condensation occurs on the head drum, a condensation warning appears in the recorder LCD and the unit enters the Stop mode, unable to function. In such a case, wait for a few hours until the indicator disappears.

Video Cassette Handling

- The GY-X1TC/GY-X1 employs only cassettes carrying the S-VHS-C and the VHS-C marks.
- Recording onto prerecorded tapes automatically erases the previously recorded video and audio signals.
- An inverted cassette cannot be inserted.
- Do not load and unload the cassette repeatedly without allowing the tape to run at all. This will slacken the tape and thereby damage it.
- Make certain before loading the cassette that the tape is not slackened. If there is any slack, turn the gear on the cassette in the direction of the arrow to take up slack.
- The cassette is equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording is impossible. If you wish to record on a cassette whose tab has been removed, use adhesive tape to reseal the slot.
- To avoid excessive exposure to dust and fingerprints, do not open the front tape cover.
- It may not be possible to record on the first 5-second section of a new tape due to winding margin.



Storage of cassettes

- Avoid exposing the cassettes to direct sunlight, keep them away from heaters.
- Avoid storing the cassettes in humid or dusty places.
- Do not drop the cassettes. Do not expose them to violent vibrations or shocks.
- Do not expose the cassettes to strong magnetic fields (near a motor, transformer or magnet).
- Place the cassettes in cassette cases and position them vertically.

Usable cassettes

It is recommended that you use the SE-C30 cassettes.

Cassette adapter

When using compact video cassettes bearing the S-VHS-C mark with full-size S-VHS equipment, use a cassette adapter compatible with S-VHS.

To play back recordings made by this unit on JVC's professional video equipment (BR-S611, BR-S811, BR-S610, BR-S810, BR-8600, BR-6600 and BR-7000), use the SA-CP series cassette adapter for professional use.

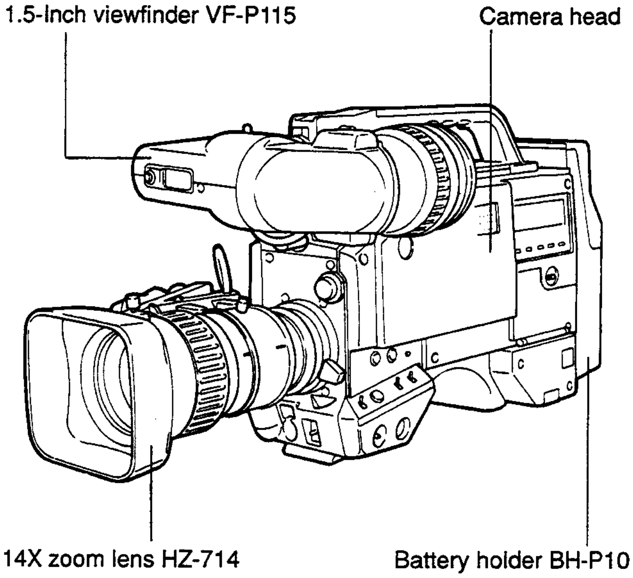
- Do not leave the unit in the Record-Pause mode for too long to avoid discharging the battery and to protect the tape.
- When using this unit as a camera alone, remove the cassette to protect the tape.

SYSTEM CONFIGURATION

The standard configuration of the GY-X1TC/GY-X1 is as shown below. Suffixes such as L14 and CH denote system configurations and do not affect the performance and operation of the system.

- Instructions in this manual generally refer to the standard configuration. When using the system in a different configuration, also refer to the instruction manuals of units to which it is to be combined.
- For information on systems using units other than standard units, consult the dealer from whom you bought the system or an authorized JVC dealer.

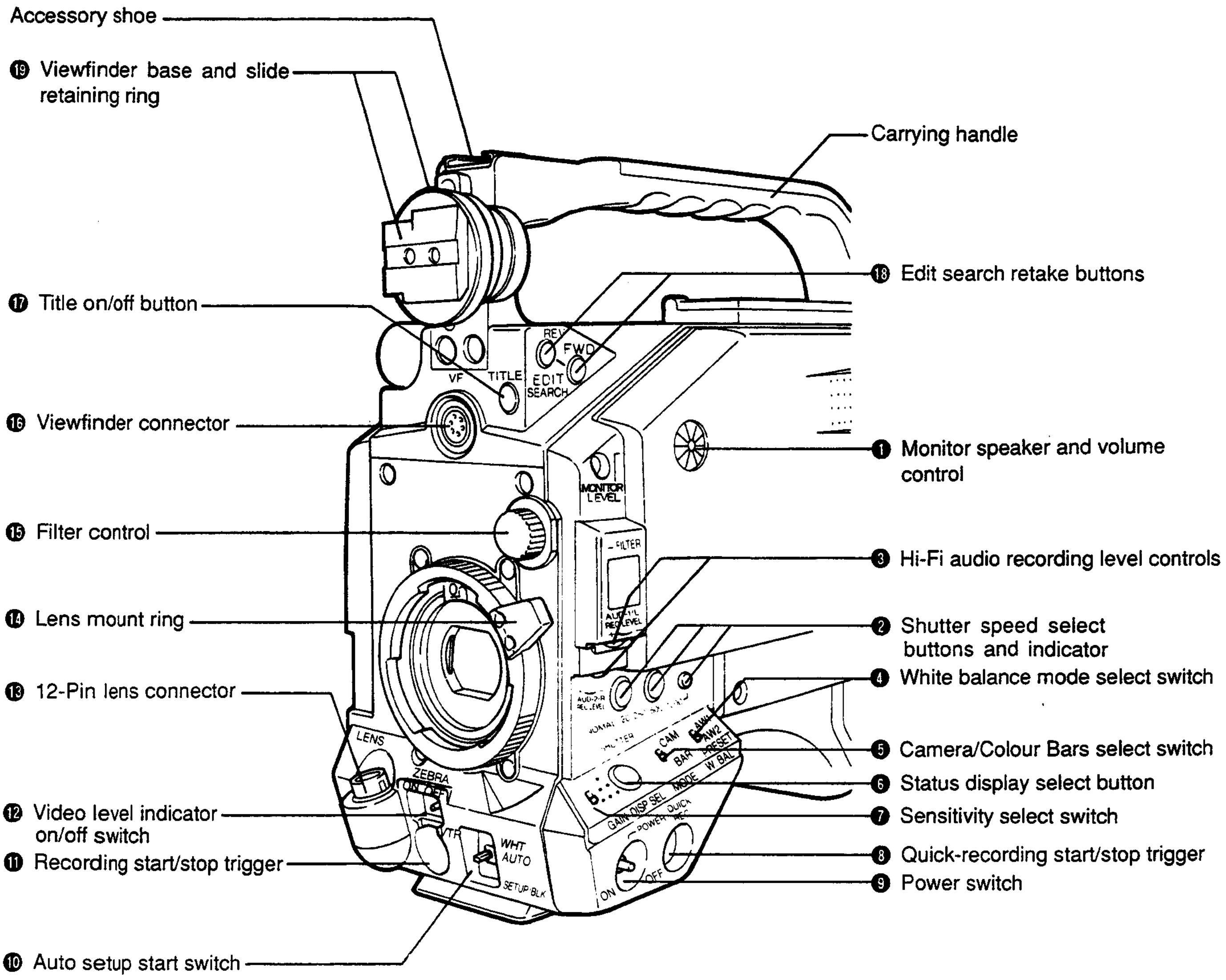
Standard Configuration



- **Some units other than the camera head may be optional depending on the configuration.**

CONTROLS, INDICATORS, AND CONNECTORS

Camera head front right-hand section


Accessory shoe
⑲ Viewfinder base and slide retaining ring
⑰ Title on/off button
⑯ Viewfinder connector
⑮ Filter control
⑭ Lens mount ring
⑬ 12-Pin lens connector
⑫ Video level indicator on/off switch
⑪ Recording start/stop trigger
⑩ Auto setup start switch
Carrying handle
⑱ Edit search retake buttons
① Monitor speaker and volume control
③ Hi-Fi audio recording level controls
② Shutter speed select buttons and indicator
④ White balance mode select switch
⑤ Camera/Colour Bars select switch
⑥ Status display select button
⑦ Sensitivity select switch
⑧ Quick-recording start/stop trigger
⑨ Power switch
VF
TITLE
EDIT SEARCH
REV
FWD
MONITOR LEVEL
FILTER
LENS
ZEBRA
ON OFF
VTR
WHT AUTO
SETUP/BLK
CAM
BAR
GAIN
DISP SEL
MODE
W BAL
AW2
PRESET
POWER
QUICK REC
ON
OFF

① **[MONITOR LEVEL] Monitor speaker and volume control**

This volume control is effective for:

- Microphone input
- VTR playback audio
- Audible warning messages

The audible warning messages can be switched off by using the memory function.

② **[SHUTTER] Shutter speed select buttons and indicator**

NORMAL button:

Engages the normal 1/50-seccond speed. Normally use this speed. (The indicator is off.)

120 250 500 1000 button:

Each time this button is pressed, the shutter speed changes to 1/120, 1/250, 1/500, 1/1000, then back to 1/120 second.
(The indicator lights.)
Effective when shooting fast-moving objects. To return to 1/50 second, press the NORMAL button.

→ 1/120 → 1/250 → 1/500 → 1/1000 ↩

❸ [AUD-1/L REC LEVEL, AUD-2/R REC LEVEL] Hi-Fi audio recording level controls

Manually adjust the recording level of the audio signal to be recorded on the tape's Hi-Fi audio track. AUD-1/L for channel 1 (left channel), and AUD-2/R for channel 2 (right channel). (The recording level of the audio signal to be recorded on the normal audio track is controlled automatically.)

❹ [W. BAL] White balance mode select switch

AUTO 1, AUTO 2:

White balance is set to the status automatically adjusted with switch ❿.

PRESET:

White balance is set to the preset standard (corresponding to a color temperature of 3200K with filter control ⓯ set to 1).

Independent white balance settings can be stored in the AUTO 1 and AUTO 2 positions. Filter-linked settings can also be used. (See page 32.)

It is also possible to use the full-time auto white balance mode in the AUTO 2 position.

❺ [MODE] Camera/Colour Bars select switch

Selects the recording or output signal.

CAM: Camera signal

BARS: Color bars signal

❻ [DISP. SEL] Status display select button

The status display function shows the unit's operation status on the viewfinder screen. Three display modes are available and can be switched by pressing this button: Mode 0, Mode 1, then Mode 2.

❼ [GAIN] Sensitivity select switch

Selects the camera's sensitivity. Available sensitivities in the three switch positions can be varied in the following five combinations by using the memory function.

Switch position	Sensitivity				
•	0 dB	0 dB	0 dB	6 dB	9 dB
• •	9 dB	6 dB	6 dB	0 dB	0 dB
• • •	18 dB	12 dB	*ALC	12 dB	18 dB

Preset prior to shipment

* ALC: Automatic Level Control mode

❽ [QUICK REC] Quick-recording start/stop trigger

Use this button as a quick-recording start/stop trigger.

Recording starts immediately when this button is pressed, with video/audio ALC and auto-iris forcibly engaged. White balance will also be automatically adjusted accordingly. Pressing this button again or button ⓫ releases the quick-recording mode and engages the Record-Pause mode. Use this function only in an emergency.

> **Allow 10 seconds or more after the power has been switched on, otherwise this function will not operate correctly.**

❾ [POWER] Power switch

❿ [AUTO] Auto setup start switch

Push the switch toward "WHT" or "SETUP/BLK" to initiate the auto setup procedure. The switch need not be pushed continuously.

WHT: For automatic adjustment of white balance only.

SETUP/BLK: For successive adjustment of black balance, white balance and black balance again.

Adjustment of black balance only is also possible in the SETUP/BLK position.

⓫ [VTR] Recording start/stop trigger

Use this button as a normal shooting start/stop trigger. Recording will start about 2 seconds after the button has been pressed. Pressing it again engages the Record-Pause mode.

> **While in the Record-Pause mode, the viewfinder indication changes as follows:**
> No indication (about one second)→Quick Review*→No indication (about one second)→Camera signal

⓬ [ZEBRA] Video level indicator on/off switch

Set this to ON to obtain the video level indication on the viewfinder screen.

⓭ [LENS] 12-Pin lens connector

For use with a lens having a 12-pin connector.

Pin No.	Function	Pin No.	Function
1	RET switch	7	IRIS position
2	VTR start	8	IRIS AUTO/MANU
3	GND	9	—
4	LENS AUTO	10	—
5	IRIS control	11	—
6	12 V DC	12	Y signal

⓮ Lens mount ring

For retaining the lens.

⓯ FILTER] Filter control

Selects the filter setting for color conversion and ND.

1. (3200K): For shooting indoors, or outdoors when illumination is insufficient.

2. (5600K): For shooting outdoors.

3. (5600K and ND filter): For shooting outdoors on sunny days.

⓰ [VF] Viewfinder connector

Connect the viewfinder cable.

⓱ [TITLE] Title on/off button

Displays the title preset using the memory function while this button is being pressed. No display is available when there is no preset title. While the title is on the viewfinder screen, other display functions such as the displays available with button ❻, warning display, and memory function display cannot be used. Use the title display only when it is necessary.

⓲ [EDIT SEARCH] Edit search retake buttons

Allows forward or reverse search while in the Record-Pause mode. Use this function to determine the start point of a retake. The search picture can be viewed on the viewfinder screen.

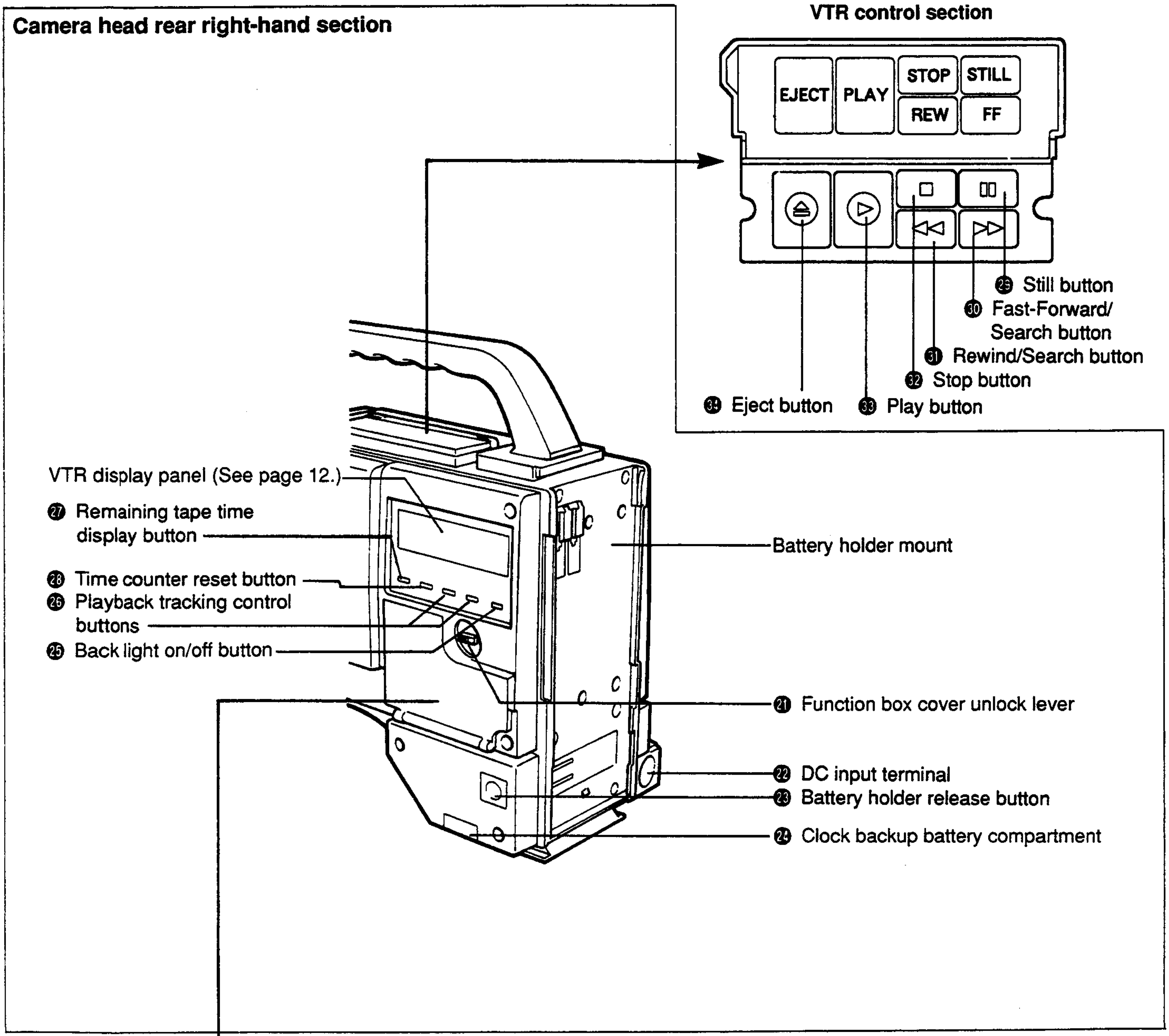
REV: For reverse search

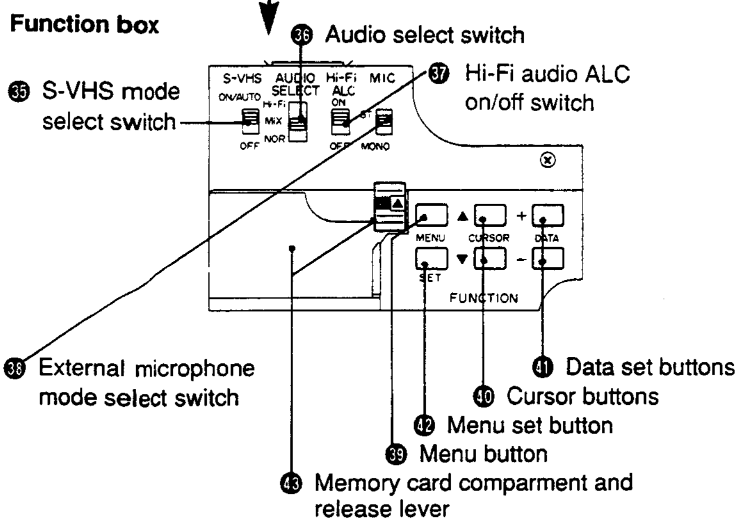
FWD: For forward search

⓳ Viewfinder base and slide retaining ring

Attach the VF-P115 viewfinder to this base and secure it with the slide retaining ring.

> **Terminology**
>
> *** Quick Review**
> A function which plays back the last two seconds of recording automatically for on-the-spot confirmation of the recording. After two seconds of playback, the tape stops automatically in the Record-Pause mode.


Camera head rear right-hand section
VTR control section
EJECT
PLAY
STOP
STILL
REW
FF
㉙ Still button
㉚ Fast-Forward/ Search button
㉛ Rewind/Search button
㉜ Stop button
㉞ Eject button
㉝ Play button
VTR display panel (See page 12.)
㉗ Remaining tape time display button
㉘ Time counter reset button
㉖ Playback tracking control buttons
㉕ Back light on/off button
Battery holder mount
㉑ Function box cover unlock lever
㉒ DC input terminal
㉓ Battery holder release button
㉔ Clock backup battery compartment


Function box
㊱ Audio select switch
㉟ S-VHS mode select switch
㊲ Hi-Fi audio ALC on/off switch
S-VHS
ON/AUTO
OFF
AUDIO SELECT
Hi-Fi
MIX
NOR
Hi-Fi ALC
ON
OFF
MIC
ST
MONO
MENU
CURSOR
DATA
SET
FUNCTION
㊳ External microphone mode select switch
㊶ Data set buttons
㊵ Cursor buttons
㊷ Menu set button
㊴ Menu button
㊸ Memory card comparment and release lever

㉑ **Function box cover unlock lever**
Push the lever to the rear (in the direction of the arrow on the lever) to open the function box cover.

㉒ **[DC IN] DC input terminal**
Apply 12 V DC from an AC power adapter.

Pin No.	Function
1	GND
2	–
3	–
4	12 V DC

㉓ **[BATT RELEASE] Battery holder release button**
Press to remove the BH-P10 battery holder.

㉔ **[CLOCK BATT] Clock backup battery compartment**
When the clock backup battery is discharged, the built-in clock and hour meter data will be cancelled when the power is switched off.

㉕ **[LIGHT] Back light on/off button**
Press to check the VTR display panel indications in the dark. Pressing this button alternates between on and off. To avoid discharging the battery, press to on only when necessary.

㉖ **[TRACKING +, –] Playback tracking control buttons**
Adjust the tracking while referring to the playback tracking display (67) in the VTR display panel. (See page 12.)

㉗ **[REMAIN] Remaining tape time display button**
Press this button while recording to check the remaining tape time, which is displayed on the time counter (73) in the VTR display panel (see page 12). Available indications are 30, 25, 20, 15, 10, 5, 4, 3, 2, 1, and 0 minutes. Press the button again to return to the ordinary elapsed time mode.

㉘ **[RESET] Time counter reset button**
Press to reset the time counter (73) (see page 12) to "00:00". Counter resetting takes place even while the remaining tape time is displayed.

VTR control section

㉙ **[STILL] Still button**
Press while in the Play mode to stop the tape temporarily; a still picture (with noise) will be obtained. This button has no effect while in the Record mode.

㉚ **[FF] Fast-Forward/Search button**
Press to fast-forward the tape. When pressed while in the Play mode, forward search at 7 times normal speed is engaged.

㉛ **[REW] Rewind/Search button**
Press to rewind the tape. When pressed while in the Play mode, reverse search at 7 times normal speed is engaged.

㉜ **[STOP] Stop button**
Press to cancel the Play, FF and REW modes. The tape will stop and the Record-Pause mode will be engaged.

㉝ **[PLAY] Play button**
Press to play back the tape.

㉞ **[EJECT] Eject button**
Press to eject the cassette. It will take about 7 seconds for the tape to be unloaded and the cassette ejected. Press this button only when the unit is in the Record-Pause mode.

The cassette cannot be ejected if the power supply is insufficient (too low or no battery power). In such a case, replace the battery pack with a charged one.

Notes for VTR operation

- Still pictures may have some noise or vibrate vertically. This is not due to any defect of the unit.
- During search, pictures may contain some noise, vibrate vertically, or become monochrome. This is not due to any defect of the unit.
- With a low-capacity power unit, or a power unit whose protective circuit characteristics are not sufficient (such as the AA-C50), the VTR may stop because of a shortage of power. To avoid this, use specified power units.
- No audio is available during search.
- When recording in the VHS mode on a tape previously recorded in the S-VHS mode, it is not possible to search or edit S-VHS recordings.
- For 7 seconds after the power has been turned on, cassette removal may not be possible even if the EJECT button is pressed.

Function box

㉟ **[S-VHS] S-VHS mode select switch**
ON/AUTO:
Automatically detects the mode of the loaded tape (S-VHS or VHS) and engages the corresponding recording mode.
OFF:
Selects the VHS mode regardless of whether an S-VHS or VHS cassette has been loaded.

㊱ **[AUDIO SELECT] Audio select switch**
Selects the audio track to be monitored, output, or displayed.
HiFi: Hi-Fi audio track
MIX: A mixture of the two
NOR: Normal audio track
Monitoring of playback audio is possible via the built-in speaker ① or earphone jack (61). Output signals are available from the audio output connectors (64) (65). The recording and playback level can be checked on the Mode-0 status display and the recording/playback audio level indicators (74).

㊲ **[HiFi REC] Hi-Fi audio ALC on/off switch**
Switches on or off the Hi-Fi audio ALC (Auto Level Control) circuit.
ON: ALC on
OFF: ALC off

㊳ **[MIC] External microphone mode select switch**
Selects the Hi-Fi recording mode of the audio signals coming from connectors (59)(60).
ST: To record independent audio signals on the right and left channels.
MONO: To recording the same audio signal on both channels.

㊴ **[MENU] Menu button**
Press to call up the memory function menu on the viewfinder screen. Press it again to cancel the menu. Also use this button to return to the master menu from one of the sub-menus.

㊵ **[CURSOR ▲, ▼] Cursor buttons**
Press to move the cursor when selecting memory function items and parameters.
▲: To move up or to the right.
▼: To move down or to the left.

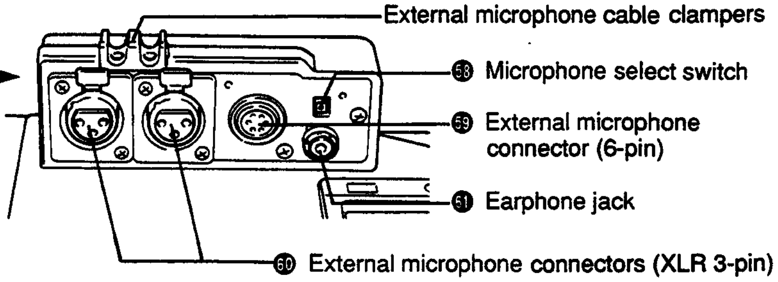
㊶ **[DATA +, –] Data set buttons**
Press to alter or set memory function parameter data.
+: To increase data in single increments.
–: To decrease data in single increments.

㊷ **[SET] Menu set button**
Press to call up the sub-menu or parameter display indicated by the cursor.

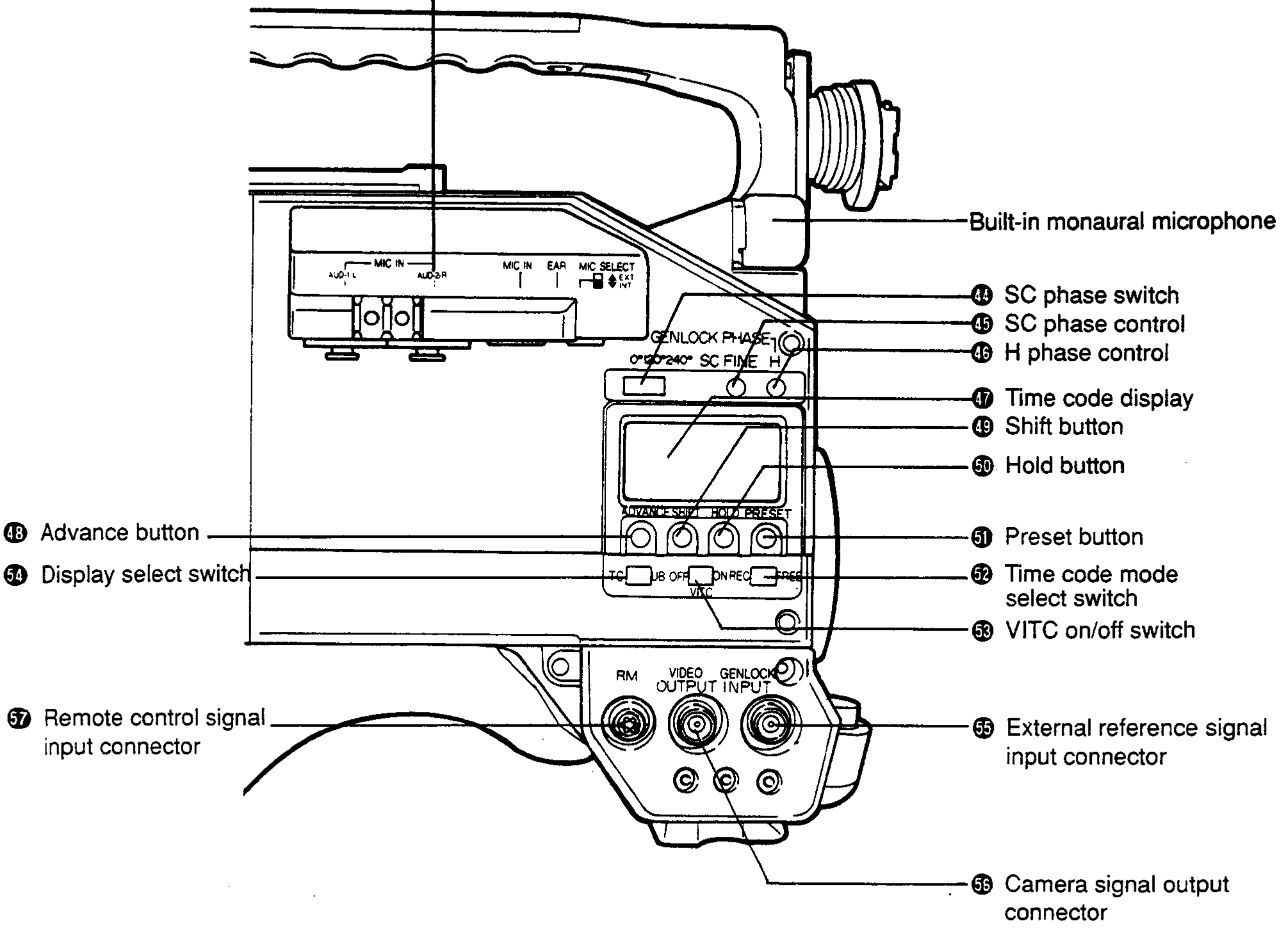
㊸ **[IC CARD] Memory card compartment and release lever**
Install a memory card used for the Advanced Memory System (AMS). To remove the memory card, push the lever up.

Camera head front left-hand section

Audio box


External microphone cable clampers
(58) Microphone select switch
(59) External microphone connector (6-pin)
(61) Earphone jack
(60) External microphone connectors (XLR 3-pin)

㊹ to (57) are provided only on the GY-X1TC.


Built-in monaural microphone
MIC IN
AUD-1 L
AUD-2 R
MIC IN
EAR
MIC SELECT
EXT
INT
GENLOCK PHASE
0° 120° 240° SC FINE H
ADVANCE SHIFT HOLD PRESET
TC UB OFF ON REC FREE
VITC
RM
VIDEO OUTPUT
GENLOCK INPUT
㊹ SC phase switch
㊺ SC phase control
㊻ H phase control
㊼ Time code display
㊾ Shift button
㊿ Hold button
㊽ Advance button
(54) Display select switch
(51) Preset button
(52) Time code mode select switch
(53) VITC on/off switch
(57) Remote control signal input connector
(55) External reference signal input connector
(56) Camera signal output connector

㊹ **[0° 120° 240°] SC phase switch**
Adjusts the colour subcarrier phase of this unit in three steps (0°, 120°, and 240°) with respect to the reference sync signal input to connector (55) in genlock operation.

㊺ **[SC FINE] SC phase control**
Fine-adjusts the colour subcarrier phase of this unit with respect to the reference sync signal input to connector (55) in gelock operation.

㊻ **[H] H phase control**
Adjusts the horizontal sync phase of this unit with respect to the reference sync signal input to connector (55) in genlock operation.

㊼ **Time code display**
Displays the time code or user's bits.

㊽ **[ADVANCE] Advance button**
Used to alter the data of the digit selected with button ㊾

㊾ **[SHIFT] Shift button**
Used to select the digit of the time code or user's bits to be set.

㊿ **[HOLD] Hold button**
Press this button before starting setting the time code or user's bits.

(51) **[PRESET] Preset button**
When this button is pressed after the required time code or user's bits have been set, the time code or user's bits are preset.

(52) **[REC/FREE] Time code mode select switch**
REC: Counts the time code only when the VTR is recording.
FREE: Counts the time code continuously regardless of the VTR status.
(Counting stops when the power is turned off.)

(53) **[VITC] VITC on/off switch**
ON: To record the VITC time code.
OFF: Not to record the VITC time code.

(54) **[TC/UB] Display select switch**
Selects the mode of the time code display㊼.
TC: To display the time code.
UB: To display the user's bits.

(55) **[GENLOCK INPUT] External reference signal input connector**
Apply a composite video signal or black burst for genlock operation.

(56) **[VIDEO OUTPUT] Camera signal output connector**
Delivers the video signal of the scene being shot, not the VTR playback signal.

(57) **[RM] Remote control signal input connector**
Connect an optional local remote control unit (RM-LP80).

Audio box

(58) **[MIC SELECT] Microphone select switch**
Selects the microphone to be used for recording.
INT: Built-in monaural microphone
EXT: Microphone connected to connector (59) or (60).

(59) **[MIC INPUT] External microphone connector (6-pin)**
When a microphone is connected to this terminal, set switch (58) to "EXT". This terminal is in parallel with terminal (60).

Pin No.	Function
A	R (Hot)
B	+9 V DC
C	GND
D	L (Hot)
E	L (Cold)
F	R (Cold)

(60) **[MIC IN AUD-1/L, AUD-2/R] External microphone connectors (XLR 3-pin)**
AUD-1/L for channel 1 (left channel), and AUD-2/R for channel 2 (right channel).
When a microphone is connected to this terminal, set switch (58) to "EXT". This terminal is in parallel with terminal (59).

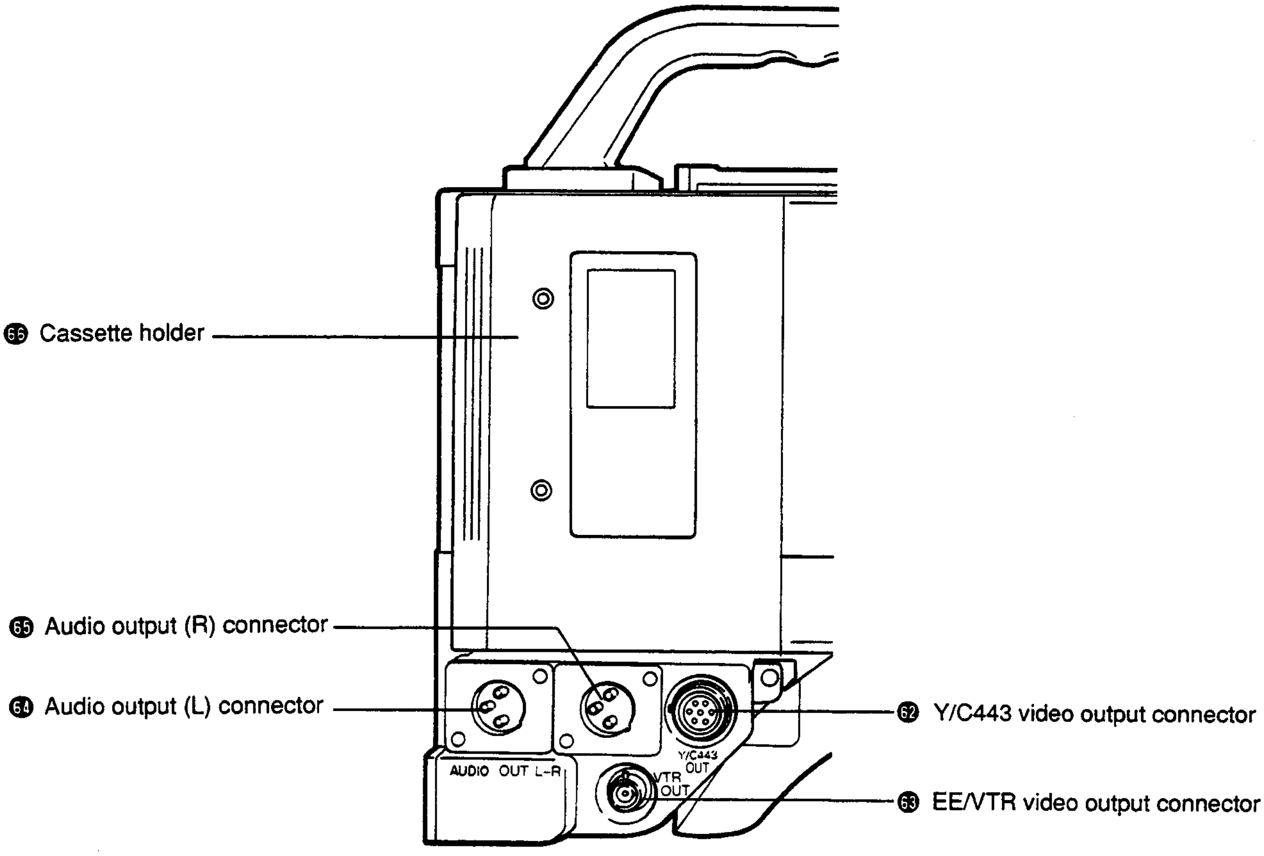
Pin No.	Function
1	GND
2	HOT
3	COLD

Note

Do not use connectors (59) and (60) at the same time, otherwise the correct input level may not be obtained.

(61) **Earphone jack**
Allows monitoring of the following audio signals via an earphone:
- Microphone input
- VTR playback audio

Camera head rear left-hand section


(66) Cassette holder
(65) Audio output (R) connector
(64) Audio output (L) connector
(62) Y/C443 video output connector
(63) EE/VTR video output connector
AUDIO OUT L-R
Y/C443 OUT
VTR OUT

(62) [Y/C443 OUT] Y/C443 video output connector
Delivers the EE signal* being recorded on the VTR or the playback video signal in the Y/C443 format.

(63) [VTR OUT] EE/VTR video output connector
Delivers the EE signal* being recorded on the VTR or the playback video signal in the composite video format.

(64)(65) [AUDIO OUT L-R] Audio output (L) (R) connectors
Deliver the audio signals being recorded or played back.

L: Left channel
R: Right channel

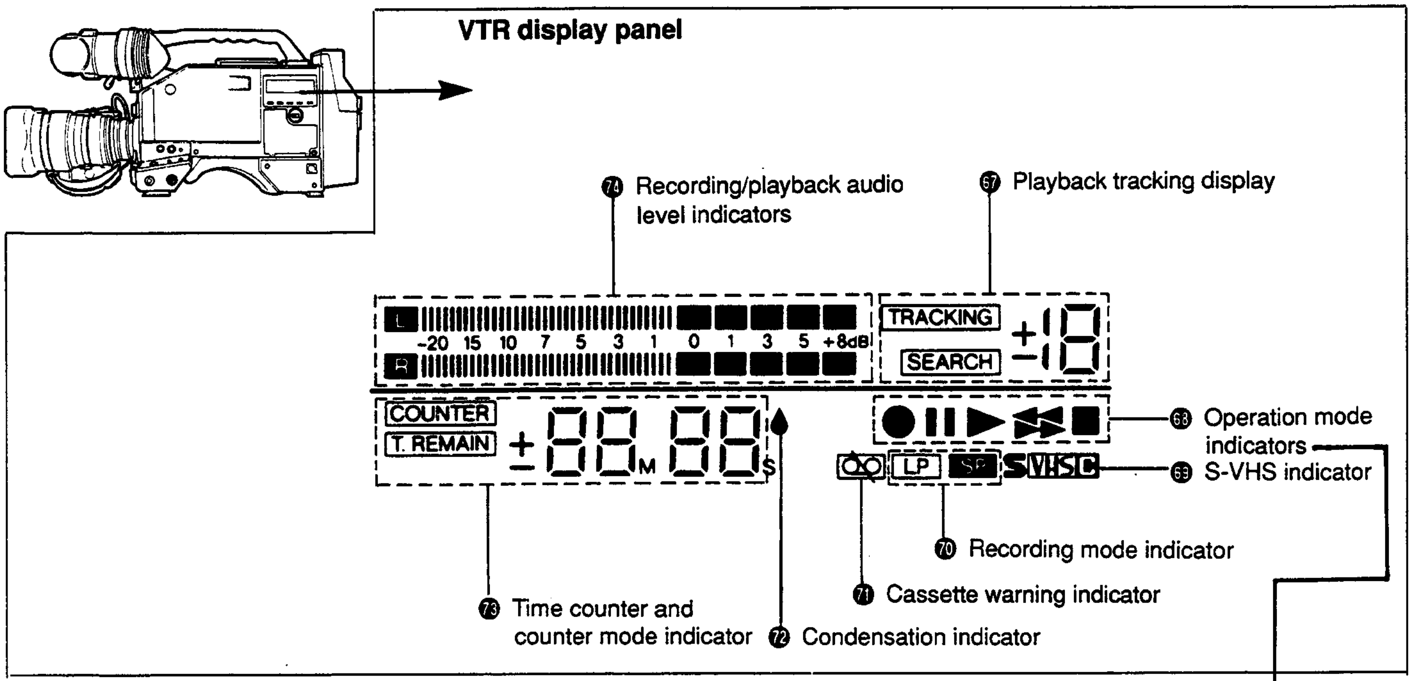
The output audio can be selected with switch (36) from Hi-Fi audio, normal audio, and a mixture of the two.

Pin No.	Function
1	GND
2	AUDIO OUT
3	GND

(66) Cassette holder
Accepts either an S VHS C or VHS C cassette.

Terminology

*** EE signal**
EE stands for Electric to Electric. The EE signal refers to a signal which is output only after being processed by the VTR's electric circuits, without passing through the magnetic circuits such as the heads and tape. To check the input signal, use the EE mode.


VTR display panel
(74) Recording/playback audio level indicators
(67) Playback tracking display
L
-20 15 10 7 5 3 1 0 1 3 5 +8dB
R
TRACKING
SEARCH
COUNTER
T. REMAIN
M
S
LP
SP
S-VHS C
(68) Operation mode indicators
(69) S-VHS indicator
(70) Recording mode indicator
(71) Cassette warning indicator
(73) Time counter and counter mode indicator
(72) Condensation indicator

Operation mode indicators

Record	Record-Pause	Play	Still	Shuttle Search		Fast-Forward	Rewind	Stop
				Forward Search	Reverse Search			
●	● ❚❚	▶	❚❚	▶ ▸▸ Blinks during edit search	▶ ◂◂	▶▶	◀◀	■

(67) Playback tracking display
Indicates the tracking value when the tracking is being adjusted with the tracking control buttons ㉖.

During shuttle search, "7" appears, indicating that the speed is 7 times normal.

(68) Operation mode indicators
Indicate the engaged mode with symbols.

(69) S-VHS indicator
Lights during recording and playback in the S-VHS mode.

(70) Recording mode indicator
Normally shows SP . When a tape recorded in the LP mode is played back, LP appears, however the Still mode will be engaged after a few seconds.

(71) Cassette warnings indicator
Blinks if no cassette is loaded, or if a cassette with its safety tab removed is loaded.

(72) Condensation indicator
Lights when condensation occurs on the video heads. Make it a rule to check this indicator before recording or playback. If it lights, do not use the unit for recording and playback until the indicator goes off. Do not record or play back while this indicator remains lit, otherwise the tape could be damaged and become unusable in extreme cases.

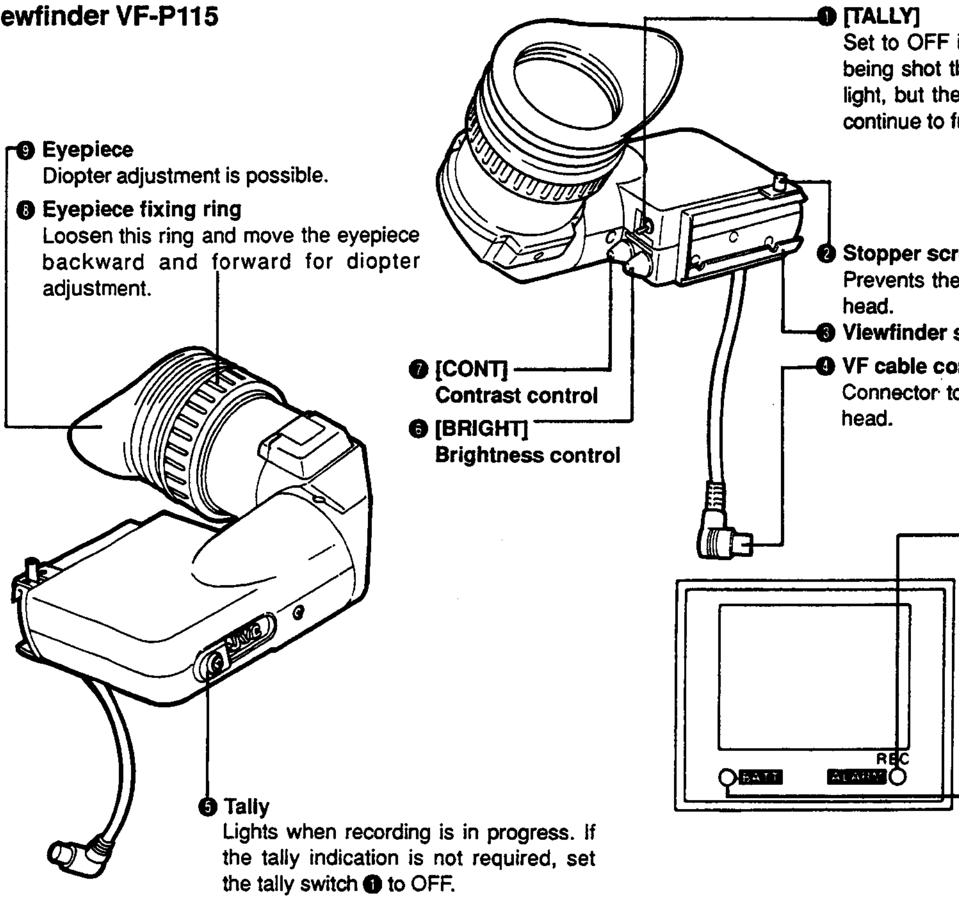
(73) Time counter and counter mode indicator
Displays the elapsed time or remaining time in minutes and seconds.

COUNTER: Lights in the Counter mode.
T. REMAIN: Lights in the Remaining time mode.

If the battery pack is in place, the elapsed time is retained in memory even after the power is turned off. With no battery pack attached, the elapsed time memory is retained only for two minutes. Battery replacement should be done promptly.

(74) Recording/Playback audio level indicators
Indicate the audio level of the audio track selected with the audio select switch ㉟ during recording and playback.

Viewfinder VF-P115



① [TALLY]
Set to OFF if you do not want to inform the people being shot that recording is on. The tally ⑤ will not light, but the REC indicator ⑩ in the viewfinder will continue to function.

② Stopper screw
Prevents the viewfinder from coming off the camera head.

③ Viewfinder shoe

④ VF cable connector
Connector to connect the viewfinder to the camera head.

⑤ Tally
Lights when recording is in progress. If the tally indication is not required, set the tally switch ① to OFF.

⑥ [BRIGHT]
Brightness control

⑦ [CONT]
Contrast control

⑧ Eyepiece fixing ring
Loosen this ring and move the eyepiece backward and forward for diopter adjustment.

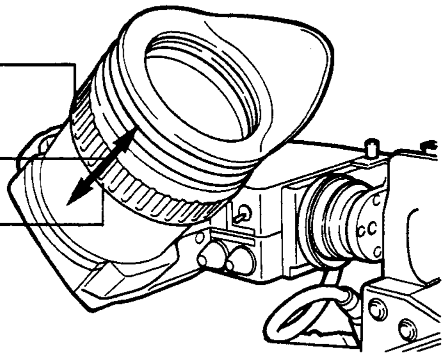
⑨ Eyepiece
Diopter adjustment is possible.

⑩ REC/ALARM indicator (green)
Lighs while recording. Blinks when the VTR malfunctions or the tape finishes.
(It also blinks when a recording is started. This indicates that the VTR is preparing to start recording, and is not a sign of a malfunction.)

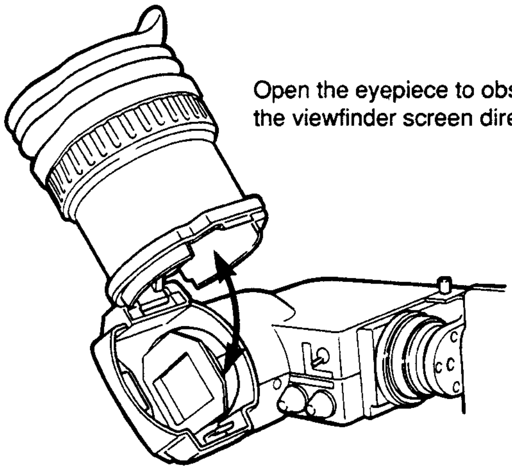
⑪ BATT indicator (red)
Lights when the battery becomes low.

- **Diopter adjustment**

1. Loosen the ring.
2. Move the eyepiece backward and forward to suit your eyesight.
3. Tighten the ring.

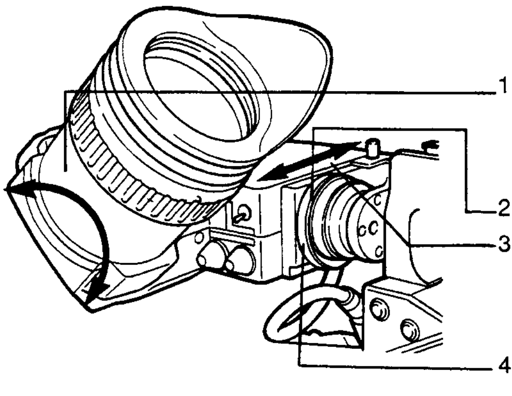


- **Eyepiece opening/closing**



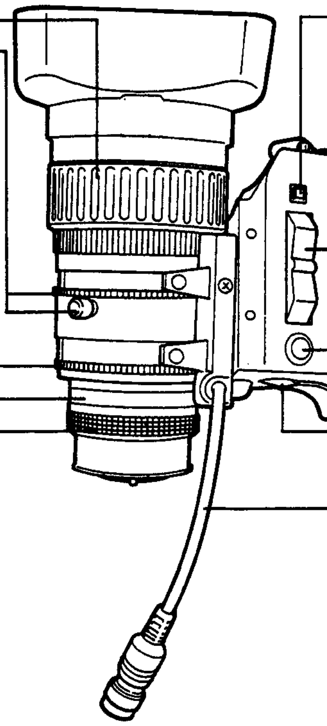
Open the eyepiece to observe the viewfinder screen directly.

- **Eyepiece positioning**



1. Adjust the angle of the eyepiece in the vertical direction.
2. Loosen the ring.
3. Move the eyepiece to the left or right for optimum viewability.
4. Tighten the ring.

Zoom lens HZ-714



❶ Focus ring

❷ Zoom lever/Zoom ring

❸ Iris ring
Can be manually controlled when the iris mode switch ❻ is set to MANU. For auto iris, set the switch to AUTO.

❹ Back focus adjustment ring
Turning this ring varies the back focus.

❺ Macro ring
When this ring is turned fully in the direction of the arrow, macro shooting is possible for subjects about 3 cm away from the lens.

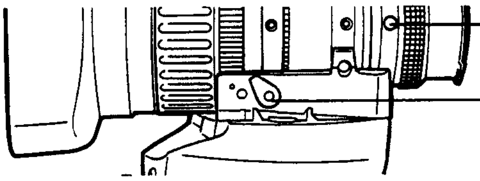
❻ Iris mode switch
AUTO: For auto iris.
MANU: For manual iris.
* When using an optional remote control unit, set this switch to AUTO.

❼ Zoom servo lever
This toggle lever controls the zooming speed and direction.

❽ [RET] Return button
Not used when this lens is used with the GY-X1TC/GY-X1.

❾ VTR start/stop button
A start/stop trigger to be used in normal shooting. Or a stop trigger to be used in quick recording.

❿ Lens cable
Connect to the lens connector on the camera head.

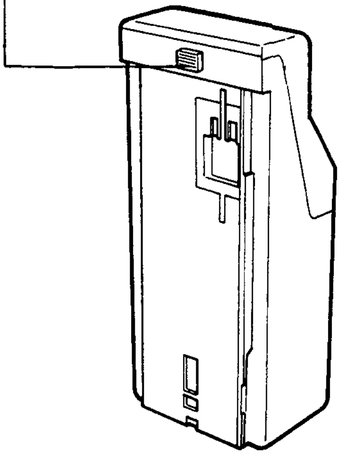


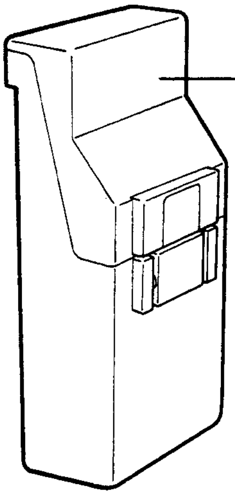
⓫ Retaining knob
To secure the back focus adjustment ring ❹.

⓬ [ZOOM] Zoom mode knob
S: For servo control of the zoom lens.
M: For manual control of the zoom lens.

Battery holder BH-P10

❶ Cover open button
Open the cover while pressing this button.

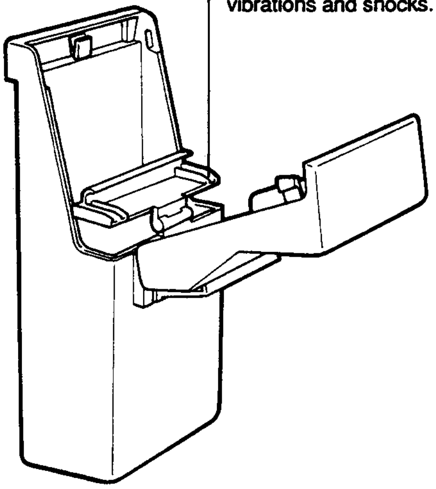




❷ Cover

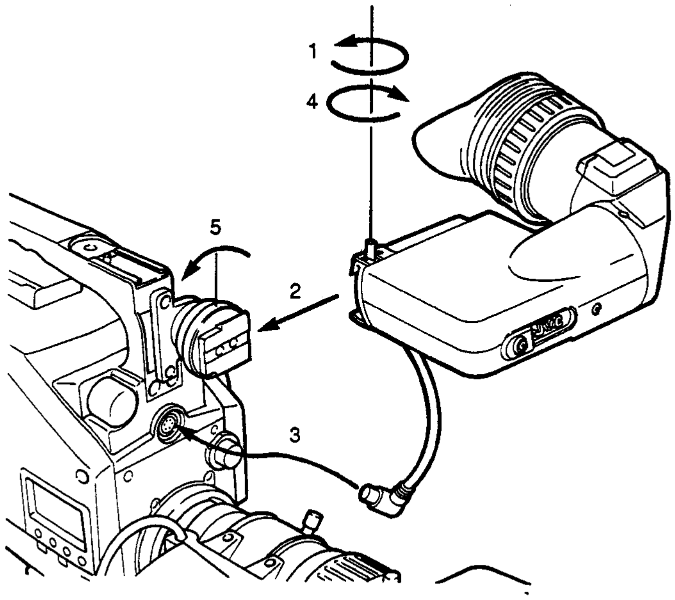
Usable battery packs
- JVC NB-G1
- SONY NP-1A
- PACO DP10, DP11

❸ Battery retainer
To prevent the battery from coming out of place due to vibrations and shocks.



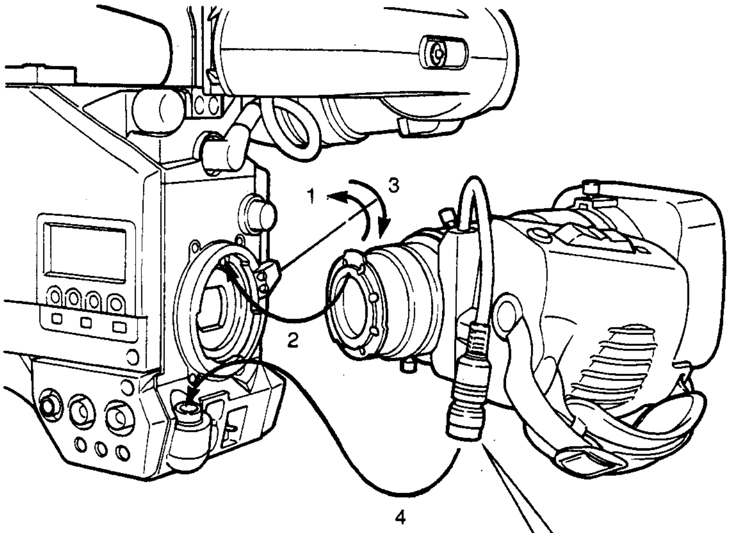
PREPARATIONS

Attaching the VF-P115 viewfinder



1. Loosen the stopper screw.
2. Attach the viewfinder with its guide aligned with the shoe.
3. Connect the cable.
4. Tighten the stopper screw.
5. Tighten the ring.

Attaching the HZ-714 zoom lens



1. Loosen the mount ring.
2. Attach the lens with its pin aligned with the hole in the mount.
3. Tighten the mount ring.

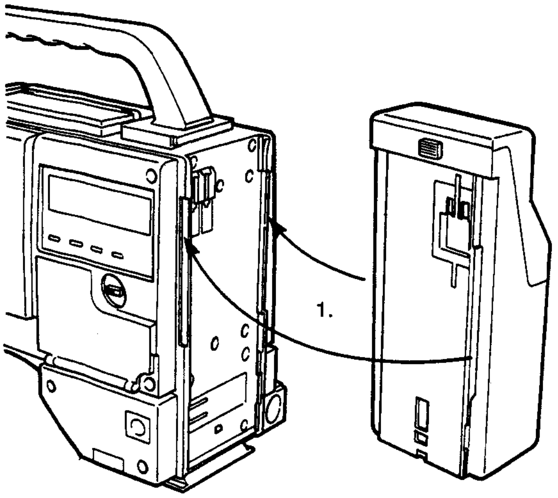
Be sure to tighten the ring completely, otherwise the lens might drop or the back focus might shift.

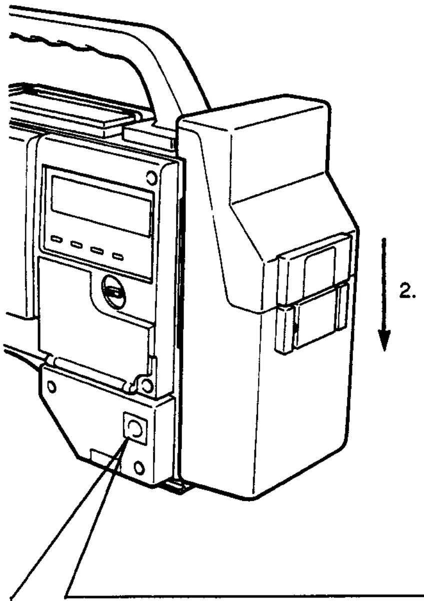
4. Connect the cable.
   Positioning marks (▼) facilitate connection.

When unplugging the cable, grasp this portion and pull up. If you have any difficulty, it may be better to remove the lens itself first. In this case, be careful not to drop the lens.

Attaching the BH-P10 battery holder

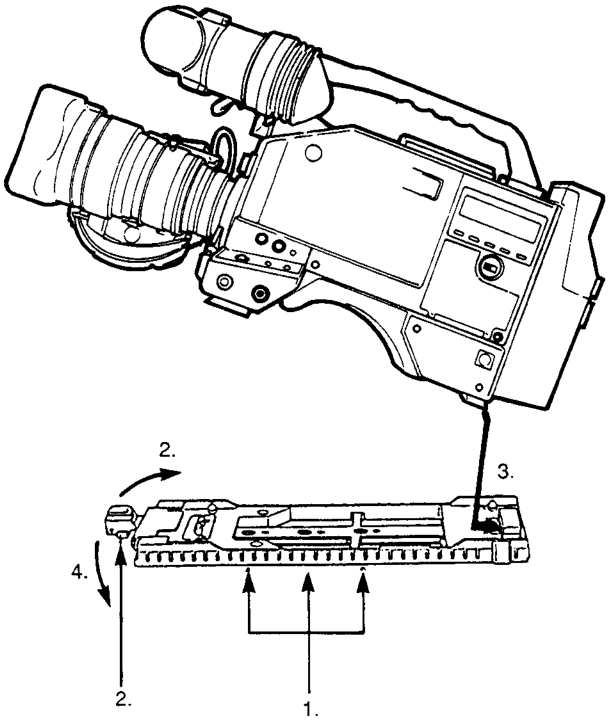
1. Align the guides of the battery holder with the rails of the camera head.
   Positioning marks (▼) facilitate connection.
2. Push down the battery holder.





When removing the battery holder, push it up while pressing this button.

Mounting on the tripod (using the KA-500X tripod base)



1. Attach the tripod base to the tripod.

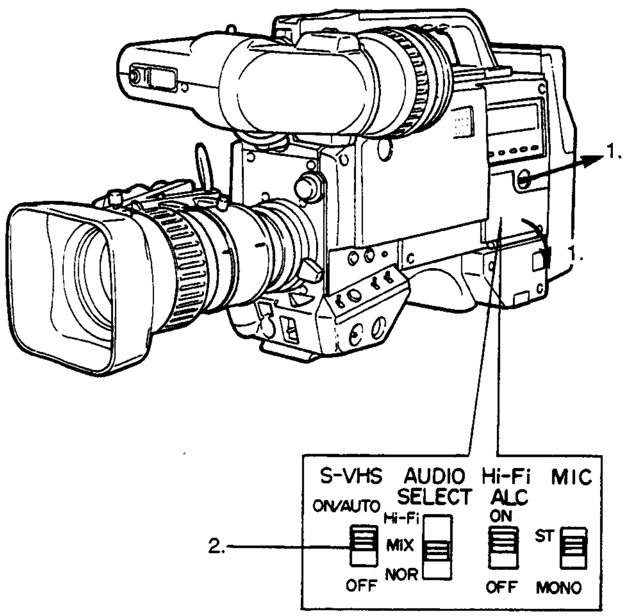
- Use either the 1/4" or 3/8" threaded hole depending on the tripod used.
- Select one of the three threaded holes (front, middle, rear) considering the center of gravity of the camera.

2. Turn the lever clockwise while pressing the unlock button of the tripod base.
3. Insert the tab on the rear of the camera into the hook on the rear of the tripod base and place the camera on the tripod base.
4. Turn the lever of the tripod base counterclockwise to secure the camera.

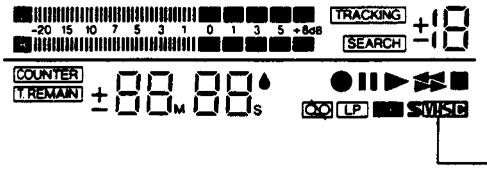
Note

When removing the camera, be sure to hold the camera by its handle with one hand, and then release the lever of the tripod base, otherwise the camera may drop off.

Video cassettes



VTR display panel



Usable video cassettes

This unit is capable of recording and playback in the S-VHS mode. To take advantage of the high resolution and high picture quality available with the S-VHS system, use video cassettes marked **"S-VHS-C"**. (**S-VHS** cassettes can also be used in the conventional VHS mode.)

Setting the S-VHS mode select switch

1. Open the function box cover by pushing the unlock lever to the rear.
2. Set the S-VHS switch as required.
   - To record in the S-VHS mode, set the switch to ON/AUTO.

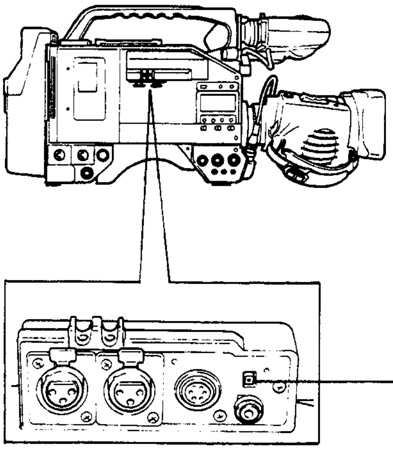
S-VHS recordings are not possible with VHS-C cassettes. With these cassettes, the VHS mode is selected automatically.

- To record in the VHS mode, set the switch to OFF.

The VHS mode is selected regardless of the type of cassette.

- In playback, there is no need to set the S-VHS mode select switch because the mode of the recorded signal is detected and switching is automatic.
- The S-VHS indicator lights during recording and playback in the S-VHS mode.

Connecting an external microphone

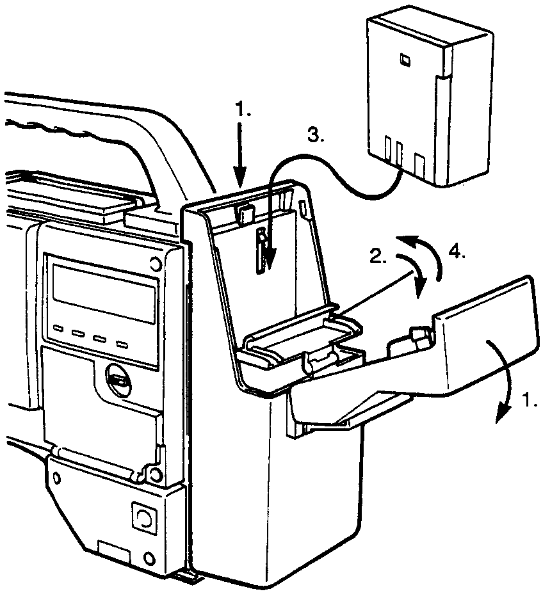


By using the optional KA-A10 microphone holder, an external microphone (optional) can be connected.

- Usable microphones
  MK-50 (monaural)
  MV-P602 (stereo)
  MV-P612 (stereo)
- When an external microphone is connected, set the MIC SELECT switch to "EXT".
- For connections, refer to the instruction manual of the KA-A10.

POWER SUPPLY

Using the NB-G1 (JVC) or NP-1A (SONY) battery pack



To install the battery pack

1. Open the cover while pressing the buttons.
2. Swing out the battery retainer.
3. Install the battery pack with its terminals facing the camera. (The illustration shows an NB-G1 battery pack.)
4. Replace the battery retainer and close the cover.

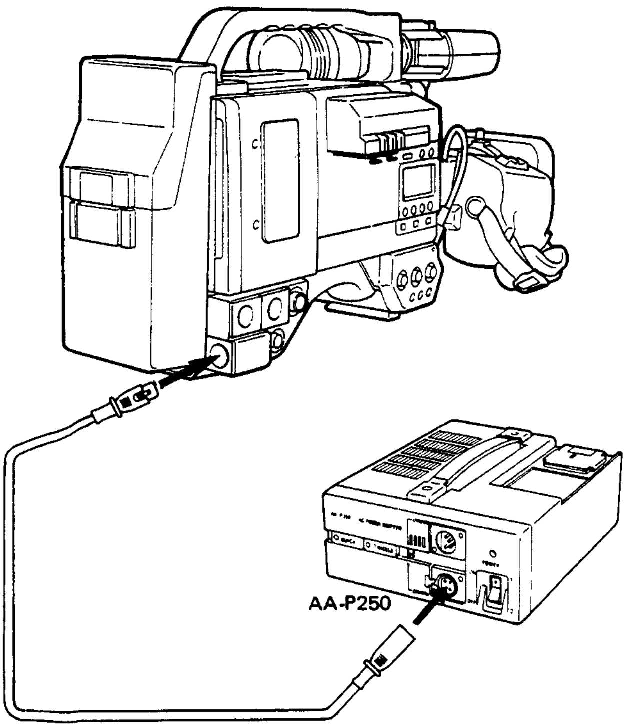
If the cover is closed without replacing the battery retainer, the battery retainer may be damaged.

Operating time

A fully charged battery pack offers the following continuous operating time at 25°C:
NB-G1: Approx. 30 minutes
The operating time may be shorter than this depending on the battery storage condition and ambient temperature.

- Before recording, charge the battery pack. It is recommended that several charged battery packs are kept at hand as spares.
- To charge the battery pack, use an optional AC power adapter. For the charging procedure refer to the instruction manual of the optional AC power adapter.
- The battery condition can be checked on the viewfinder screen. (See page 31.)
- When the battery pack is becoming low, a warning indicator appears. (See page 23) When this indicator is seen, replace the battery pack with a charged one.
- Do not leave the battery pack in a place subject to high temperatures, as this could damage it and make it unusable.

Using the AA-P250 AC power adapter



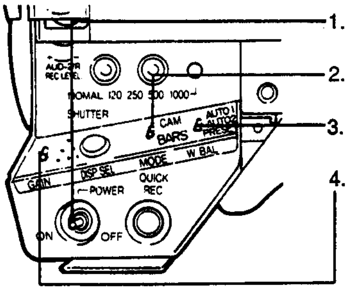
1. Connect the camera head to the AC power adapter using the cable provided with the AC power adapter.
2. Set the switch to CAMERA.
3. Set the POWER switch of the AC power adapter to ON.

Do not use power units other than specified, otherwise the recorder may stop due to a temporary drop in power because of the operation of the protective circuit.

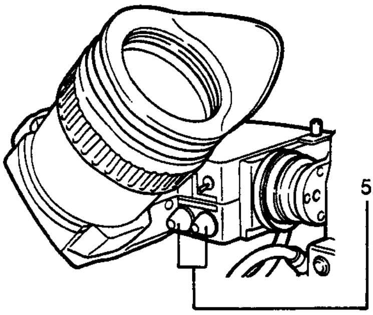
ADJUSTMENTS

Before making adjustments

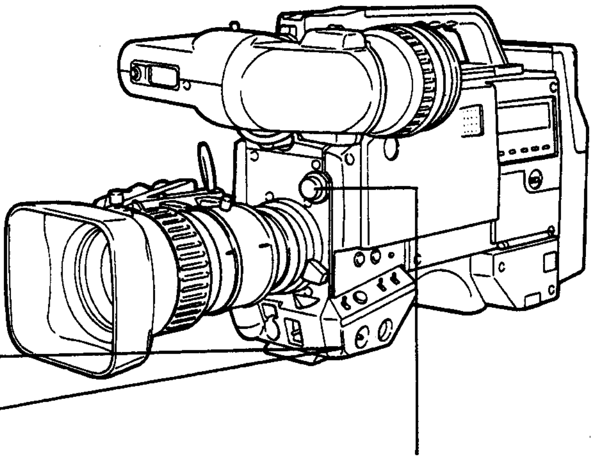
Turn the power on and set the switches and controls as follows:



1. "ON"
2. "CAM"
3. "AUTO 1"
4. Set this so that "0 dB" appears on the viewfinder screen.



5. Adjust the brightness and contrast of the viewfinder picture.



Select the filter by turning the filter control.
Position 1 (3200K): For shooting indoors or outdoors when illumination is not sufficient.
Position 2 (5600K): For shooting outdoors.
Position 3 (5600K + ND): For shooting outdoors on sunny days.

Adjusting the back focus

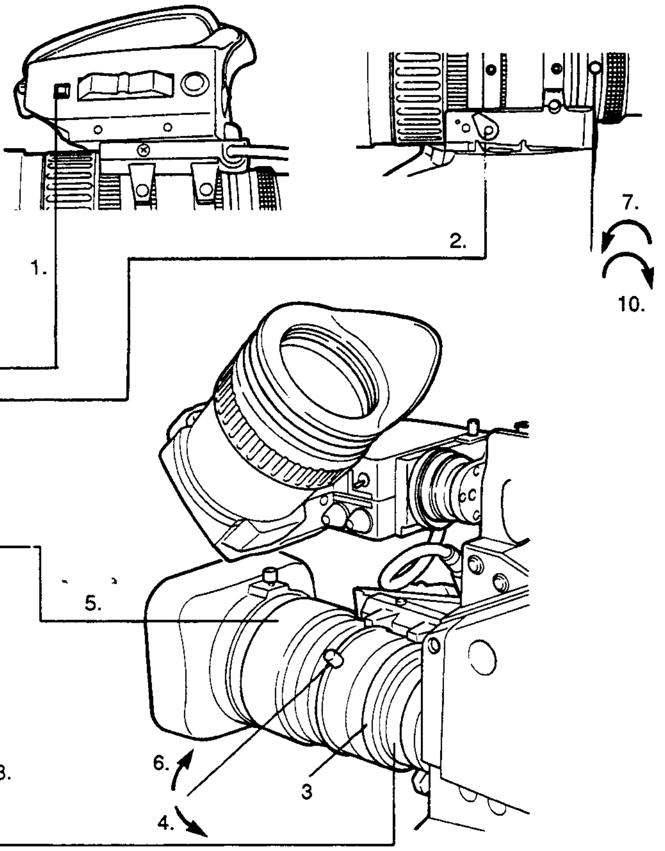
Back focus adjustment is needed only in the following cases:

- When a lens is attached for the first time, or the lens is replaced.
- When correct focus is not available in both telephoto and wide-angle positions.

Procedure
Follow the steps in "Before making adjustments".

- Back focus adjustment should be done while referring to the viewfinder picture.
- More correct adjustment is possible if the subject is at a distance of more than 3 m from the camera.

1. Set the iris mode switch to MANU.
2. Set the zoom mode switch to M.
3. Set the iris ring to "open" (1.4).
   If the illumination is too strong, reduce it or move to a darker place.
4. Set the zoom lever fully to TELE.
5. Focus on the subject.
6. Set the zoom lever fully to WIDE.
7. Loosen the back focus ring retaining knob.
8. Adjust the back focus ring for the best possible focus.
9. Repeat steps 4 through 8 several times for fine adjustment.
10. Tighten the back focus ring retaining knob to secure the back focus ring.



Adjusting the white balance and black balance

White balance adjustment is needed only in the following case:

- When the light source illuminating the subject is changed before shooting or during shooting.

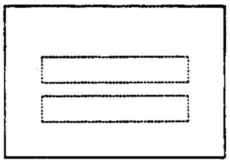
Procedure

Follow the steps in "Before making adjustments".

1. Set the iris mode switch to AUTO.
2. Shoot a white object (such as a cloth, wall) to fill the screen.
3. Push the AUTO switch as required.
   - Up (toward WHT) to adjust white balance only. (No need to keep it depressed.)
   - Down (toward SETUP/BLK) to adjust both white balance and black balance at the same time. (No need to keep it depressed.)

- It is also possible to adjust black balance independently by using the memory function. (See page 32)

4. During adjustment, messages showing the process will be seen on the viewfinder screen.



Items to be adjusted

- AUTO WHITE 1 (AUTO1 mode)
- AUTO WHITE 2 (AUTO2 mode)
- AUTO BLACK (Auto Black)
- AUTO SET UP (appears after completion of simultaneous white and black balance adjustments)

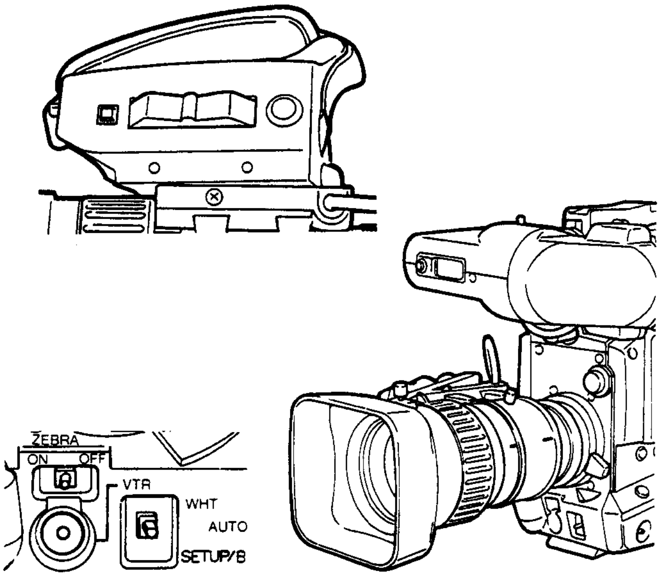
Process of adjustment

- OPERATION (adjustment is being executed)
- COMPLETED (adjustment is completed)

Black balance adjustment is needed only in the following cases:

- When this unit is used for the first time, or after a long period of storage.
- When the ambient temperature has changed drastically.

Normally, it is not necessary to re-adjust the black balance when the power is turned off and then turned on again.



Error messages

These messages are given as warnings.

If an errror message appears, check for the following causes, then perform adjustment again.

- LOW LIGHT ERROR

  Cause : Insufficient lighting.
  Remedy : Increase lighting, or increase sensitivity with the GAIN switch. (The S/N will deteriorate with increased sensitivity.)

- OBJECT ERROR

  Cause : The object being shot is not appropriate.
  Remedy : Check whether it is sufficiently white, and change it if necessary.

- OVER LIGHT ERROR

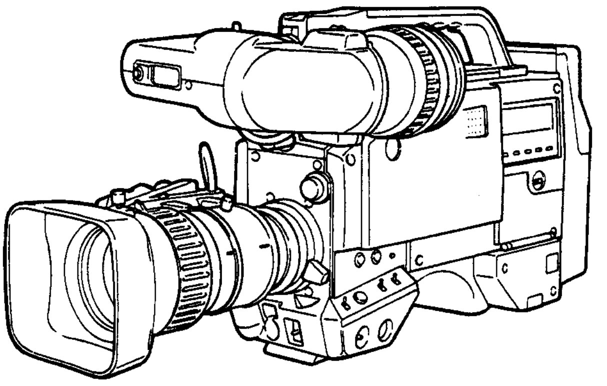
  Cause : Incoming light is too strong.
  Remedy : 1. Check whether strong light such as direct or reflected sunlight is striking the lens.
  2. Set the filter control correctly.

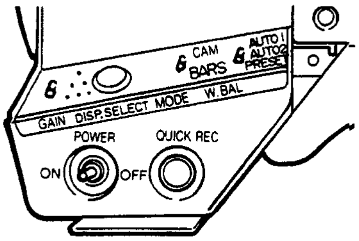
- LENS NOT CLOSE?

  Cause : Lens is not in auto operation.
  Remedy : Check the lens cable connection.

IMPORTANT FUNCTIONS

White balance mode setting and white balance memories





This unit is capable of holding white balance settings adjusted according to the lighting condition in memory.

White balance modes

Set the white balance mode as required with the W. BAL switch.

AUTO 1, AUTO 2 : To obtain automatically adjusted white balance settings. It is also possible to use the full-time auto white in the AUTO2 position.

PRESET : To use a preset white balance setting corresponding to a color temperature of 3200K with the filter control set to 1.

- When the switch is reset, the corresponding mode is displayed on the viewfinder screen for a few seconds.

White balance memories AUTO 1 and AUTO 2

This unit has two independent memories which are capable of storing independent white balance settings. It is possible to set filter-linked white balance settings for each memory.

Prior to shipment

AUTO 1 :Filter-linked operation.
AUTO2 :No filter-linked operation.

To store settings into memory

1. Set the filter control according to the lighting condition.
2. Select the memory (AUTO 1 or AUTO 2) with the W. BAL switch.
3. Perform white balance adjustment. (See page 20.)
4. The white balance setting in the selected filter position will be stored in memory.

- When filter-linked operation is not used, the white balance will vary if the filter position is changed.
- In filter-linked operation, store white balance settings at each filter position following steps 1 through 4.
- Setting to filter-linked operation is performed using the memory function. (See page 32.)

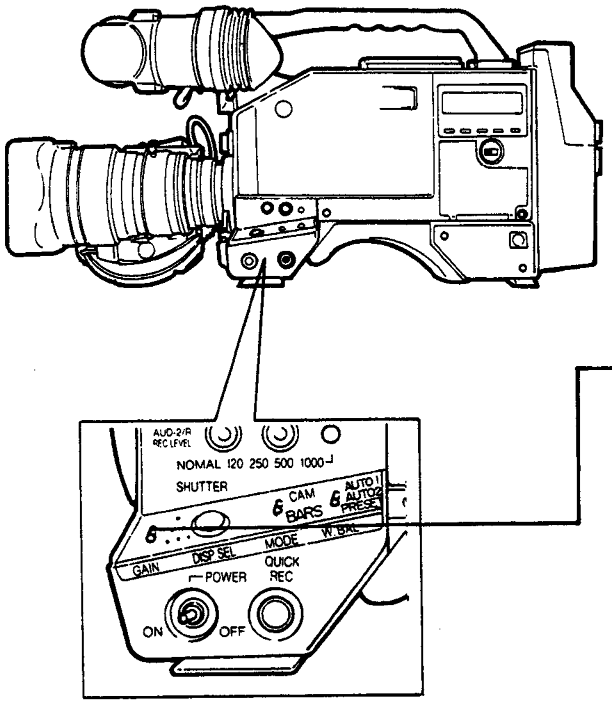
Full-time auto white

"Full-time auto white" is a function which allows the white balance setting to automatically track the lighting no matter how the lighting condition may vary during shooting. The full-time auto white mode is automatically engaged regardless of the setting of the W. BAL switch when recording is initiated using the quick-recording trigger.

- White balance may not be perfect if the entire picture has a uniform colour tone.
- Use this function in emergency shooting, when there is no time to adjust white balance, or no white balance settings are held in memory.
- It is also possible to program the memory so that the full-time auto white mode is engaged by setting the W. BAL switch to AUTO 2. (See page 32.)

Sensitivity setting

When the subject is dark and the amount of light is not sufficient, the camera's sensitivity can be increased electronically.



To select the sensitivity

To select the sensitivity, set the GAIN switch as required. There are five sets of available sensitivities at three switch positions. The combination of sensitivities can be selected using the memory function. (See page 32.)

Switch position	Sensitivity (The greater the value, the higher the sensitivity.)				
●	0 dB	0 dB	0 dB	6 dB	9 dB
●●	9 dB	6 dB	6 dB	0 dB	0 dB
●●●	18 dB	12 dB	*ALC	12 dB	18 dB

Preset prior to shipment.

* ALC: Automatic Level Control mode

- The higher the sensitivity, the more grainy the picture.
- When the switch position is changed, the available sensitivity is displayed for a few seconds on the viewfinder screen.

Video ALC (Automatic Level Control)

Video ALC is a function which allows the camera's sensitivity to be adjusted automatically according to the brightness of the subject.

The video ALC automatically functions regardless of the setting of the GAIN switch when recording is initiated using the quick-recording trigger. The video ALC starts operating when the iris reaches a certain value. This makes it possible to shoot while keeping the depth of focus constant.

- The higher the sensitivity, the more grainy the picture.
- It is possible to make the video ALC function in the "●●●" position of the GAIN switch, by using the memory function. (See page 32.)
- The iris value at which the video ALC starts operating can be set by using the memory function. (See page 32.)
- Sensitivity varies continuously between 0 dB and 12 dB.

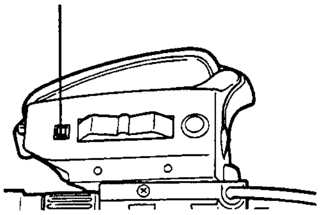
Auto iris and APB function

Auto iris is a function which determines the aperture of the lens automatically according to the brightness of the subject.

In measuring light, the peak and average levels are detected and mixed at a certain ratio. With conventional auto iris systems, this mixing ratio is fixed. The APB (Automatic Peak and average Balance) function mixes the peak and average levels at an optimum ratio according to the subject, thereby ensuring an optimum iris.

To engage the auto iris mode:

Set the IRIS MODE switch of the lens to AUTO.



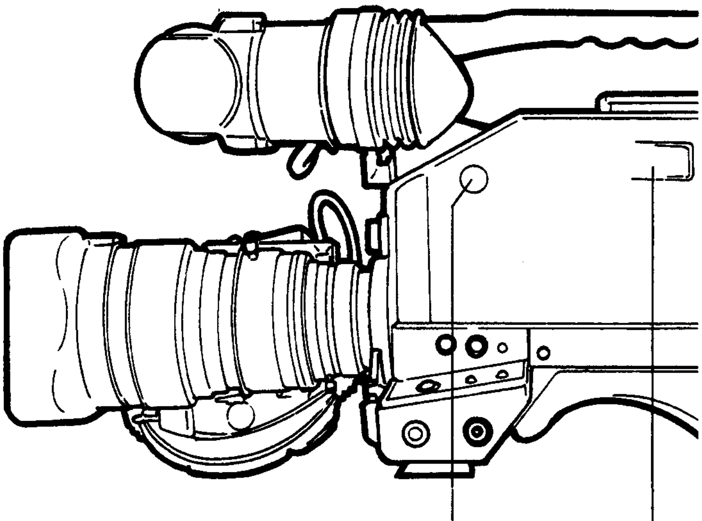
To change the auto iris parameters:

It is possible to change the auto iris parameters by using the memory function. (See page 32.)

- Iris level
- APB on/off
- Peak/average mixing ratio
- Light measuring region
- Response speed
- Video ALC limit

Warning functions

This unit warns the operator of various malfunctions, if any, during shooting/recording by means of both audio and viewfinder messages.



Adjust the speaker volume with the volume control.

Warning by audio

Messages in a female voice are heard from the monitor speaker.

Messages include:

"VTR warning."

This message is heard when tape running is not proper because of condensation on the heads, or a servo system malfunction.

"End of tape."

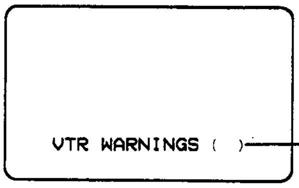
This message is heard when the remaining tape time reaches less than 2 minutes. If you want to continue recording, replace the cassette.

"Low battery."

This message is heard when the battery is depleted. Replace the battery pack with a charged one.

- It is possible to defeat the audible messages by using the memory function. (See page 32.)

Warning indications on viewfinder screen



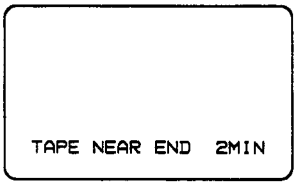
VTR WARNINGS ( )

This indication blinks when tape running is not proper, and the cause is indicated in parentheses as follows:

DEW: Condensation on the video heads.

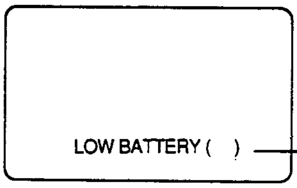
SERVO: Servo failure.

(blank): Other malfunctions.



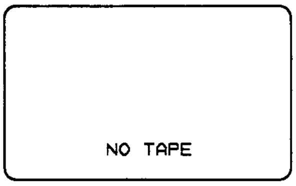
TAPE NEAR END 2MIN

This indication blinks when the remaining tape time reaches less than 2 minutes. Continues blinking with the time counting down in minutes to zero.



LOW BATTERY ( )

This indication starts blinking when the battery voltage drops, and the voltage is indicated in parentheses.



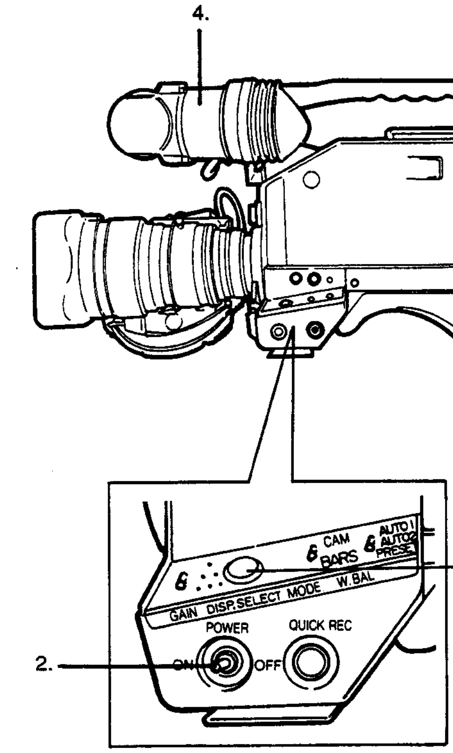
NO TAPE

This indication blinks for a few seconds after the VTR start/stop trigger or quick recording start/stop trigger is pressed with no cassette loaded or with a cassette whose safety tab has been removed.

- No warning indication is possible when a title is displayed on the viewfinder screen.
- No warning indication appears during tape playback.
- The "NO TAPE" indication does not appear when the Mode-2 status display (see page 31) is on the viewfinder screen.
- Warning indications will disappear when the status display mode is changed with the DISP. SEL button. Do not attempt to change the status display mode until the cause of the warning is eliminated.

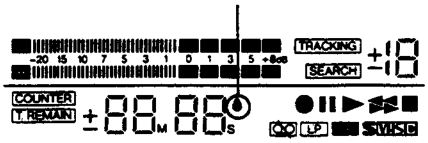
SHOOTING OPERATION

Normal shooting


4.
CAM
BARS
AUTO1
AUTO2
PRESET
5.
GAIN
DISP.SELECT
MODE
W.BAL
POWER
QUICK REC
2.
ON
OFF

1. Install a charged battery pack.
2. Set the POWER switch to ON.
3. Make sure that the condensation indicator is off. If it is on, wait until it goes off.

Condensation indicator


-20 15 10 7 5 3 1 0 1 3 5 +8dB
TRACKING
SEARCH
COUNTER
T.REMAIN
M
S
LP

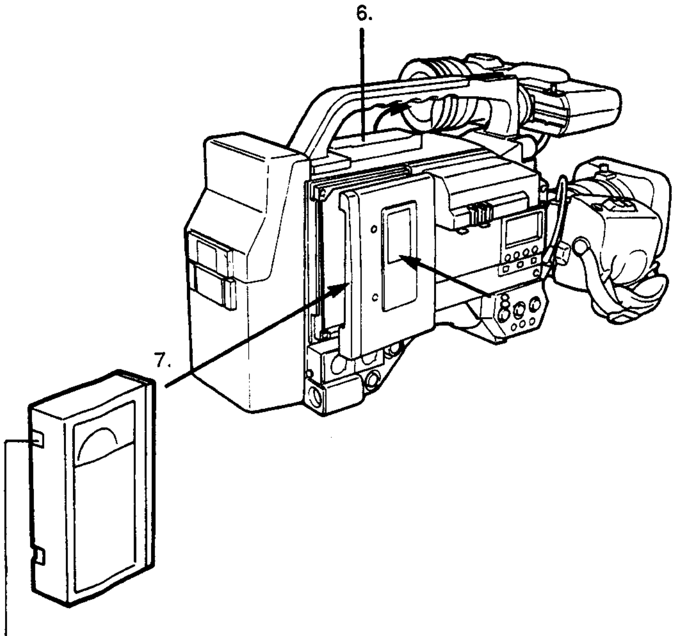
When there is condensation, a warning indication also appears on the viewfinder screen. (See page 23.)

4. Adjust the brightness and contrast of the viewfinder picture.
5. Press the DISP. SEL (Status Display Select) switch a number of times to obtain the mode-2 display (see below) and check the battery voltage.

```
29. 8 '91   10:16
PRESET  STUDIO1
GAIN        0dB
WHT BAL     AW1
FILTER      3.2K
SHUTTER     NORMAL
ABL         OFF
A.KNEE      OFF
BATT        13.2V
```

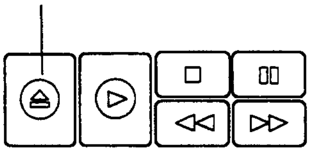
Viewfinder screen

- More than 12 V is necessary for proper operation.
- With a fully charged battery pack, 13 V or so will be displayed.


6.
7.
Safety tab

6. Open the VTR control section cover and press the EJECT button.
   (Pressing the EJECT button immediately after the power has been turned on may fail to open the cassette holder. Wait for about 7 seconds.)

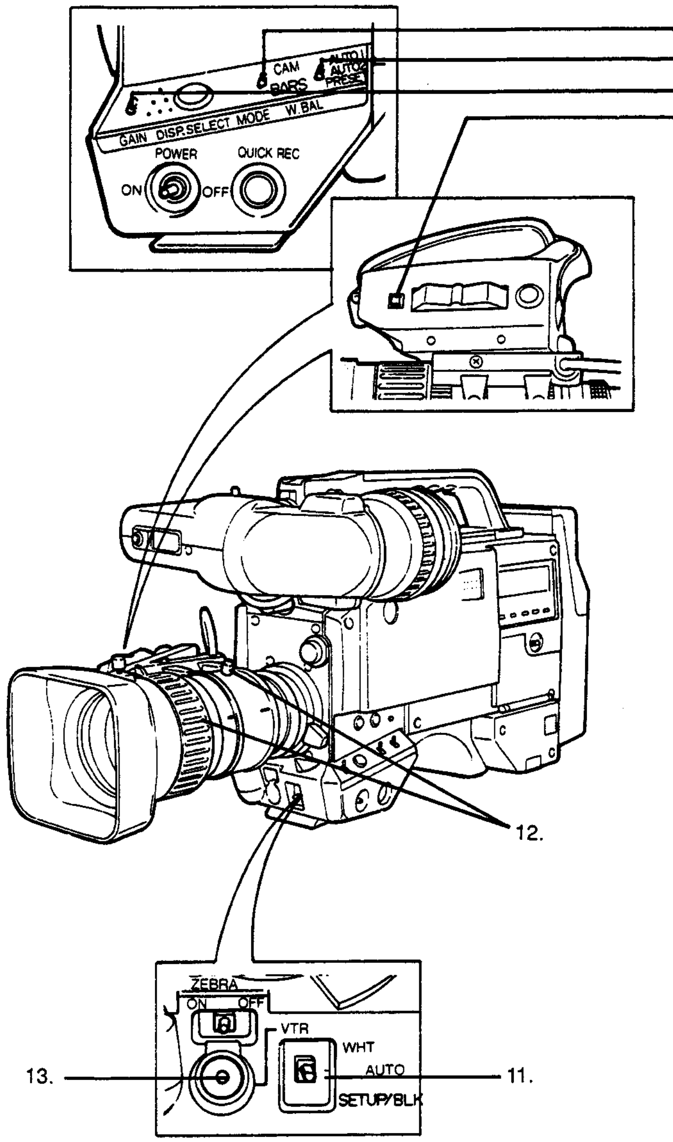
EJECT button



7. Load a video cassette with its safety tab in place.
   (Insert the cassette fully, otherwise the tape could be damaged.)
8. Close the cassette holder securely by pressing its center portion.
   The tape will be loaded automatically, and the unit will enter the Record-Pause mode. (It takes about 15 seconds.)

Related subjects and reference pages

- Viewfinder display (→ Page 31)
- Video cassettes and mode setting → Page 17)
- VTR display panel (→ Page 12)



9. Set the switches as required.
   "CAM"
   "AUTO 1" or "AUTO 2"
   Sensitivity suitable for the subject.
   "AUTO"

10. Select the filter according to the lighting condition.

Position 1 (3200K):	For shooting indoors or outdoors when illumination is not sufficient.
Position 2 (5600K):	For shooting outdoors.
Position 3 (5600K+ND):	For shooting outdoors on a sunny day.

11. Adjust the white balance and black balance. (See page 20.)

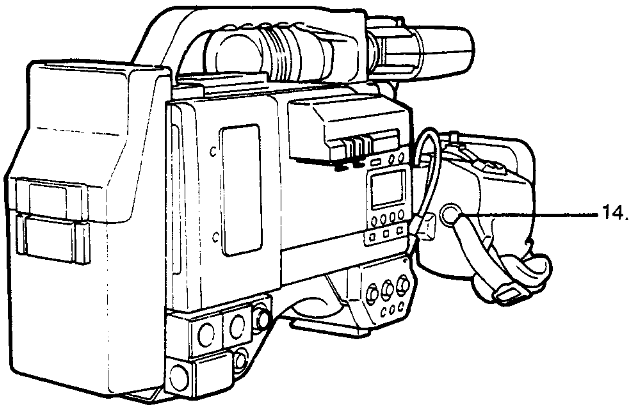
12. Point the camera at the subject and determine the angle of view and focus with the zoom lever and the focus ring.

13. Press the VTR start/stop trigger on the camera or lens. Recording will start in about 2 seconds. Pressing the trigger again will engage the Record-Pause mode after quick-review.

14. When shooting is completed, eject the cassette and turn the power off.

Notes

- If you switch off the power within one second after the cassette holder is opened, it may not be closed fully.
  In this case, turn the power on and close the cassette holder. Then turn the power off.
- The cassette cannot be ejected if the power supply is insufficient (too low or no battery power). In such a case, replace the battery pack with a charged one.
- While in the Record-Pause mode, the viewfinder indication changes as follows:
  No indication (about one second)→Quick Review*→
  No indication (about one second)→Camera signal
- The REC/ALARM indicator (green) in the viewfinder blinks until recording actually starts. This is not due to any defect of the unit, but indicates that the VTR is preparing for recording.



Related subjects and reference pages

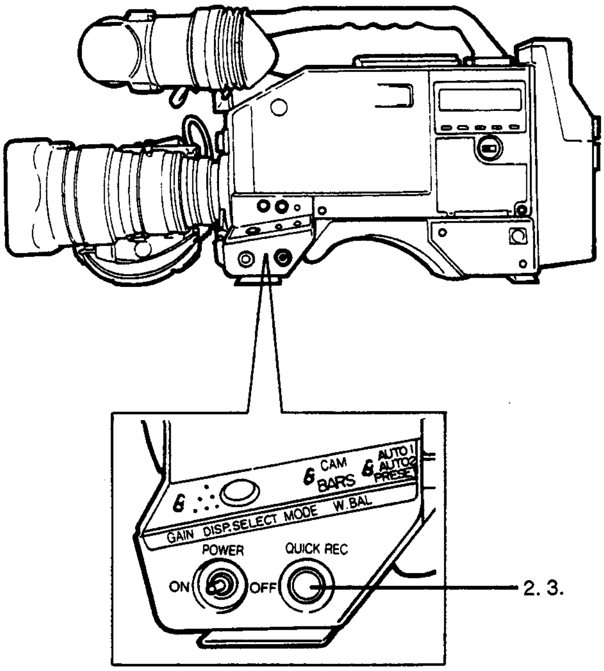
- Audio level adjustment (→ Page 27)
- Title display on/off (→ Page 30)
- Warning messages (→ Page 23)
- Quick-review (→ Page 6)

Quick recording

The quick-recording function ensures pictures of reasonable quality even when there is no time for camera adjustments and settings.
When you start recording with the quick-recording trigger, the camera is in the status shown next regardless of the settings of the switches and the memory function.

- Auto iris
- Video and audio ALC
- Full-time auto white balance
- Camera output even when color bar is selected.

Allow 10 seconds or more after the power has been switched on, otherwise the quick-recording function will not operate properly.



Items to be checked

- For the quick-recording function to work properly, steps 1 through 8 in "Normal shooting" must have been completed. In other words, at least check the following items:
  1. A charged battery must be installed.
  2. There is no condensation on the video heads.
  3. A cassette with its safety tab in place must be loaded.

Procedure

1. Check points 1, 2 and 3 above.

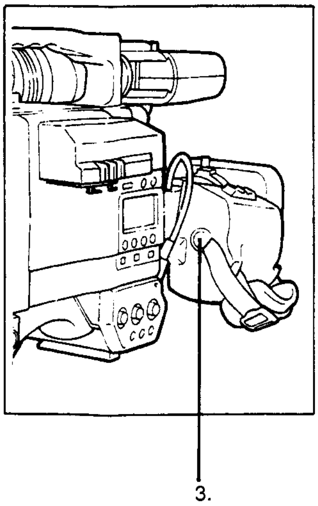
2. Press the QUICK REC trigger. Recording will start in about 2 seconds.

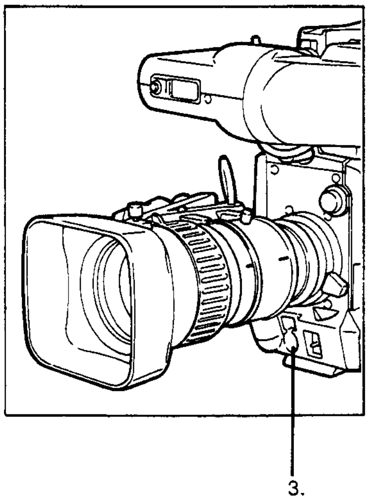
3. To stop recording, press one of the following triggers:
   - QUICK REC trigger
   - VTR trigger on the camera
   - VTR trigger on the lens

   When recording is stopped, the camera resumes the status in which it was before quick recording was initiated.

Special mode

- There is a special quick recording mode.
  In the special mode, the camera does not return to the original status after recording is stopped, but stands by for the next quick recording trigger.
  This special mode is available by using the memory function. (See page 32.)
  Normal shooting is possible even after the special mode is set by the memory function. However, once quick recording is initiated, normal shooting is not possible unless the power is switched off and on again. (When the power is switched on again, the special mode is disengaged.)

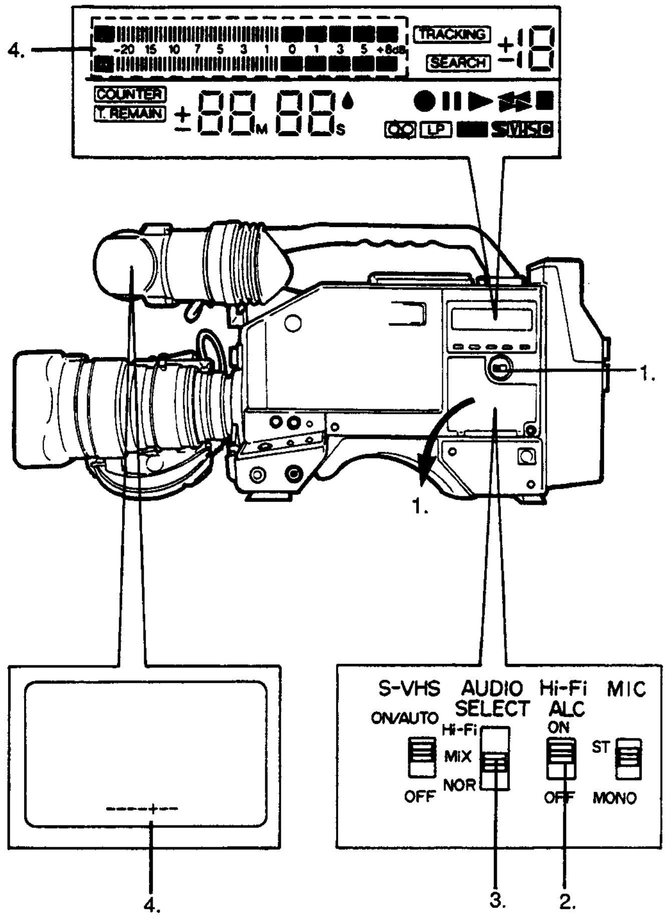




Related subjects and reference pages

- Auto iris (→ Page 22)
- Full-time auto white (→ Page 21)
- Video ALC (→ Page 22)

Audio level checking and setting

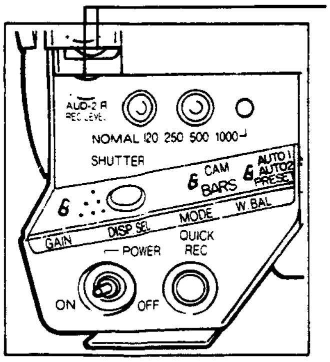

4.
-20 15 10 7 5 3 1 0 1 3 5 +8dB
TRACKING
SEARCH
COUNTER
T.REMAIN
M
S
LP
S-VHS
1.
1.
S-VHS
AUDIO SELECT
Hi-Fi ALC
MIC
ON/AUTO
OFF
Hi-Fi
MIX
NOR
ON
OFF
ST
MONO
4.
3.
2.

Audio level checking

The recording level can be checked on the viewfinder screen or the VTR display section.

1. Open the function box cover by pushing the unlock lever to the rear.
2. Set the Hi-Fi ALC switch to OFF.
   (For automatic control of the Hi-Fi audio recording level, set the switch to ON.)
3. Select the audio track to be checked with the AUDIO SELECT switch.
   Hi-Fi : Hi-Fi audio track
   NOR : Normal audio track
   MIX : A mixture of the two
4. Check the audio level.
   - Referring to the VTR display section, it is possible to check both channels independently.
   - Referring to the viewfinder screen, call up the Mode-0 status display. The L and R channels are mixed and the level is indicated in 7 steps. ("+" corresponds to 0 dB.)
5. Adjust the audio level.
   - When the Hi-Fi ALC is in the OFF position, the Hi-Fi audio recording level and balance are adjusted manually. (See the figure, left.)

- The normal audio (monaural) recording level is adjusted automatically.
- If the recording level is excessively high, howling might occur, or warning messages will be picked up and recorded.
- The warning messages from the monitor speaker can be defeated using the memory function. (See page 32.)


AUD-2 R
REC LEVEL
NOMAL 120 250 500 1000
SHUTTER
CAM
BARS
AUTO1
AUTO2
PRESET
GAIN
DISP SEL
MODE
W.BAL
POWER
QUICK REC
ON
OFF

Recording level

The recording level can be checked on the viewfinder screen or the VTR display section. The recording level is optimum when the level indicator shows about 0 dB with the loudest input.

AUD-1/L: Channel 1 (left) level
AUD-2/R: Channel 2 (right) level

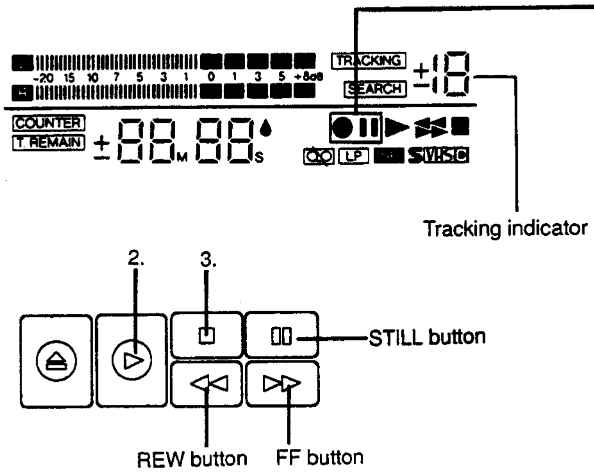
Higher ↶ Lower

Turn the control.

Related subjects and reference pages

- Warning messages (→ page 23)

Checking the playback picture



To rewind or fast-forward the tape:
Press the REW or FF button while in the Record-Pause mode; the tape will be rewound or fast-forwarded.
To return to the Record-Pause mode, press the STOP button.

To play back the tape:

1. Load a recorded cassette and make sure that the unit is in the Record-Pause mode.
2. Press the PLAY button.
   Playback pictures will be seen on the viewfinder screen.
3. Press the STOP button to stop playback.
   After playback is stopped, the Record-Pause mode will be engaged.

To view a still picture:
Press the STILL button while in the Play mode. To return to normal playback, press the PLAY button.

When the STILL button is pressed in the Still mode, the picture is advanced by one frame. Keeping the Still button depressed advances the picture continuously.

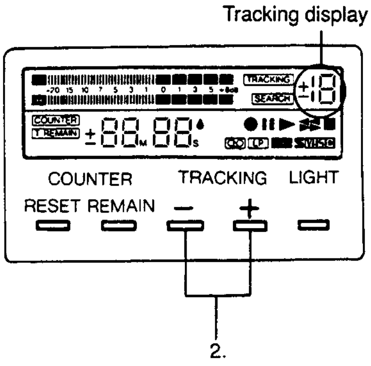
To search at high speed:
Press the REW or FF button while in the Play mode; reverse or forward search will start. To return to normal playback, press the PLAY button.

During searach, the tracking indicator displays "7". This has nothing to do with tracking, but indicates that the search speed is 7 times normal.

Notes for VTR operation

- If a cassette whose safety tab has been removed is loaded, the unit will enter the Stop mode, instead of the Record-Pause mode.
- When recording in the VHS mode on a tape previously recorded in the S-VHS mode, it is not possible to search S-VHS recordings.
- Still pictures may contain some noise or vibrate vertically. This is not due to any defect of the unit.
- During search, pictures may contain some noise, vibrate vertically, or become monochrome. This is not due to any defect of the unit.
- No audio is available during search.
- When tapes areplayed back in a place subject to excessive vibrations, colour pictures may not be obtained.

Tracking control

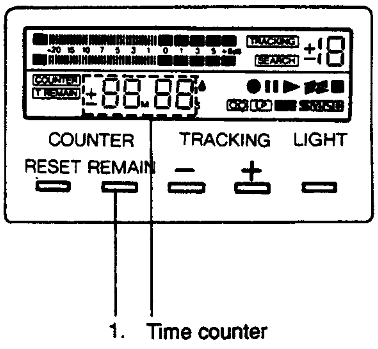


Perform tracking adjustment when the playback picture is too grainy, or contains noise.

1. Play back the tape.
2. Press the TRACKING button "+" or "–" to reduce noise while checking the playback picture.

- The tracking display shows up to +15 or down to –15.
- To reset the tracking display to +0, press both TRACKING buttons simultaneously.
- When the power is switched on the tracking display is reset to +0.

Remaining tape time display


TRACKING
SEARCH
COUNTER
T. REMAIN
COUNTER
TRACKING
LIGHT
RESET
REMAIN
1. Time counter

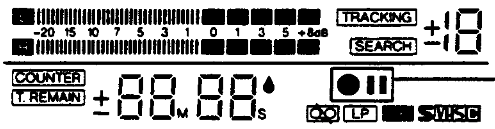
The remaining tape time can be checked on the Mode-1 status display (see page 31), or on the VTR display section.

1. Press the REMAIN button during recording.
   The VTR display time counter will show the remaining time in a few seconds.

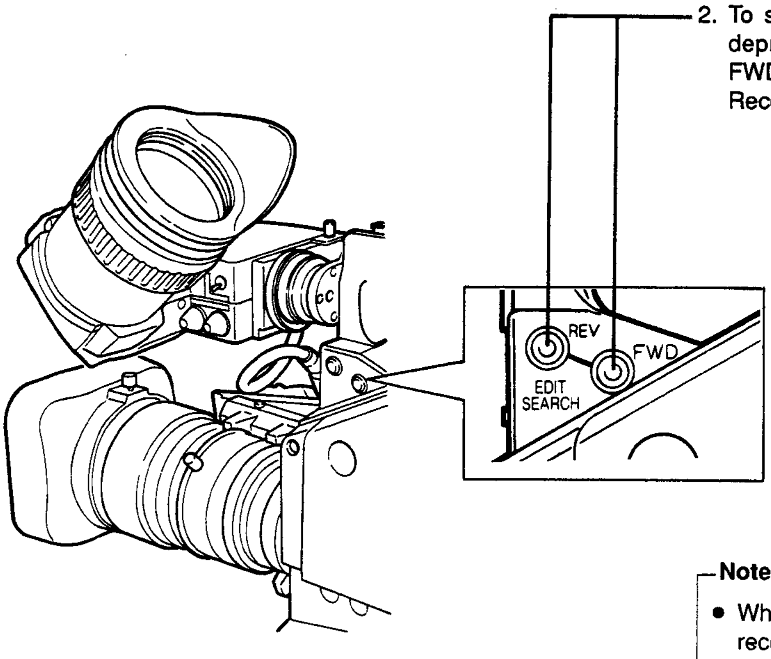
- Available indications are 30, 25, 20, 15, 10, 5, 4, 3, 2, 1, and 0 minutes.
- Press the button again to return to the ordinary elapsed time counter display.
- The remaining tape time indication is not displayed during playback.

Retake function by Edit Search

The retake function allows checking of the recorded picture without leaving the Record-Pause mode. Determine the point at which you want to start the next take while checking the search picture at normal speed in either direction.


-20 15 10 7 5 3 1 0 1 3 5 +8dB
TRACKING
SEARCH
COUNTER
T. REMAIN
LP

1. Make sure that the unit is in the Record-Pause mode.

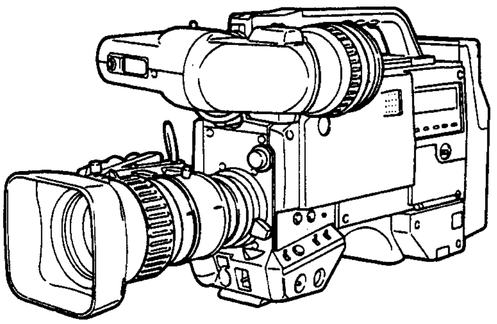

REV
FWD
EDIT SEARCH

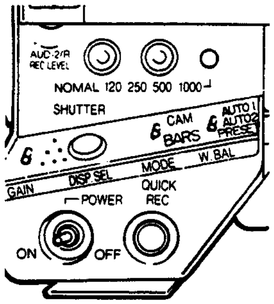
2. To search in the reverse direction, keep the REV button depressed. To search in the forward direction, keep the FWD button depressed. When the button is released, the Record-Pause mode will be engaged.

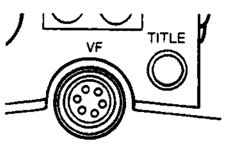
Notes for VTR operation

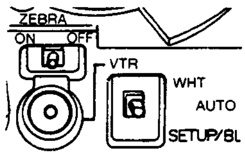
- When recording in the VHS mode on a tape previously recorded in the S-VHS mode, it is not possible to search or edit S-VHS recordings.

SPECIAL FUNCTIONS









Auto equalizer (AEQ) reference signal (provided only on the GY-X1TC)

If you are going to edit footage recorded with this unit using the JVC BR-S811 and BR-S611 S-VHS recorders, use the AEQ function to obtain better dubs.

An AEQ on/off switch is provided inside the unit. Prior to shipment, this switch is preset to ON.

When the AEQ switch is set to ON, a reference signal is recorded during the blanking period of the video signal being recorded. When a tape recorded in this way is played back on the BR-S811 and BR-S611, the AEQ circuit in these machines will perform frequency compensation according to the recorded reference signal, thereby improving the dubbing quality.

- The reference signal is recorded on line 17 during the vertical blanking period. If this is not appropriate for some reason, the reference signal recording position can be changed or the AEQ switch can be set to OFF. For more information, consult the dealer from whom you purchased this unit or a JVC dealer.

Electronic shutter

The electronic shutter mode which offers higher shutter speeds is effective when shooting fast-moving objects that may be analyzed later in playback. While the standard shutter speed is 1/50 second, the electronic shutter mode offers five speeds: 1/120, 1/250, 1/500 and 1/1000 second.

To engage the electronic shutter mode:

1. Press the 120 250 500 1000 button. The LED will light.

   Each time the button is pressed, the speed changes in the following sequence:

   → 1/120 → 1/250 → 1/500 → 1/1000 ↩

   The selected shutter speed will be displayed for a few seconds on the viewfinder screen.

2. To return to the normal shutter speed, press the NORMAL button. (The LED will go off.)

- The higher the shutter speed, the lower the sensitivity. Brighter lighting is necessary when using high shutter speeds. Do not use high shutter speeds in dimly lit places.
- In the auto iris mode, the iris is wider in the high speed mode than in the normal shutter mode. This also changes the depth of focus.
- When the high speed mode is used under fluorescent lighting, the picture may flicker.

Video level indication

A zebra pattern shows the portion the video level of which is about 80% to 90%. Refer to this indication when adjusting the iris manually.

ZEBRA switch ON : Indication on.
ZEBRA switch OFF : Indication off.

Title display

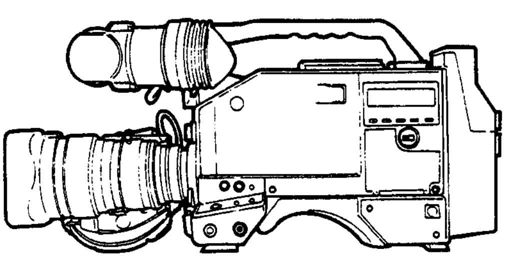
The title preset using the memory function can be recorded superimposed on the scene being shot. The title is displayed on the viewfinder screen.

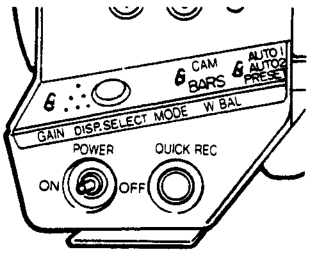
To call up the title display:

1. Press the TITLE button. The title will be displayed. (If pressed during recording, it will be recorded.)
2. Releasing the button cancels the title display.

- As long as a title is on the screen, warning messages and the status display are not available. Call up the title display only when it is necessary.
- For composing titles, see page 35.
- Nothing will be displayed if a title has not been preset.

Status display





The status display function indicates the statuses of the camera and VTR on the viewfinder screen. Three display modes are available: Mode-0, Mode-1, and Mode-2.
Mode-0 is engaged when the power is switched on.

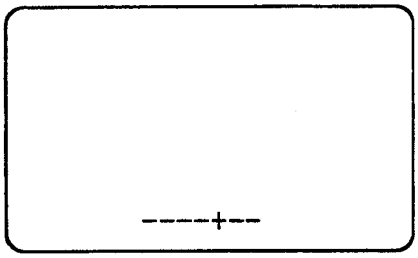
To select the mode:

1. Press the DISP. SEL button.
   Each time, the button is pressed, the mode changes in the following sequence:

$$\begin{tikzcd} \text{Mode-0} \arrow[r] & \text{Mode-1} \arrow[r] & \text{Mode-2} \arrow[ll, bend left] \end{tikzcd}$$

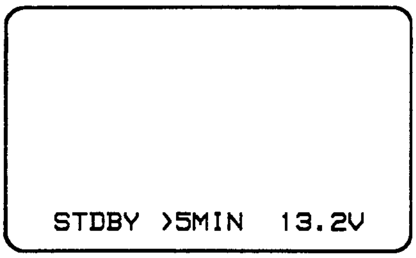
- During tape playback, or when a title is on the screen, the status display cannot be used.

Mode-0



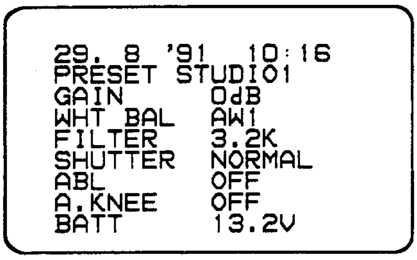
```
-----+--
```

Mode-1



```
STDBY >5MIN  13.2V
```

Mode-2



```
29. 8 '91   10:16
PRESET STUDIO1
GAIN       0dB
WHT BAL    AW1
FILTER     3.2K
SHUTTER    NORMAL
ABL        OFF
A.KNEE     OFF
BATT       13.2V
```

Mode-0

① The recording level of the audio track selected with the AUDIO SELECT switch (see page 27) is displayed as monaural (L + R) in 7 steps.
This indication can be defeated using the memory function. (See page 32.)

Mode-1

② The operating status of the VTR is displayed.

STDBY	: Recording standby (Record-Pause)
REC	: Recording in progress
QREC	: Quick recording in progress
QREC (blinking)	: Special mode quick recording in progress
No indication	: Playback (including search)

③ The remaining tape time is displayed in minutes.
">5MIN" is displayed until the tape reaches the point 5 minutes before the tape end, after which the time is displayed in minutes.

④ One of the following, selected by the memory function, is displayed: (See page 32.)

Battery voltage	
Camera sensitivity	: same as ⑦
Filter position	: same as ⑨
Shutter speed	: same as ⑩
White balance mode	: same as ⑧

Mode-2

The camera status, battery voltage, etc. are displayed together.

⑤ Date and time

⑥ Scene file name
(Initial indication prior to shipment is "PRESET INITIAL".)

⑦ Camera sensitivity: 0 dB, 6 dB, 9 dB, 12 dB, 18 dB, ALC

⑧ White balance mode : PRESET, AW1, AW2
AW1-F (filter-linked)
AW2-F (filter-linked)
FAW (full-time auto white)

⑨ Filter position: 3.2K (1), 5.6K (2), 5.6K + ND (3)

⑩ Shutter speed: NORMAL, 1/120, 1/250, 1/500, 1/1000

⑪ ABL (Auto black level control) ON/OFF

⑫ Auto knee ON/OFF

⑬ Battery voltage

MEMORY FUNCTION

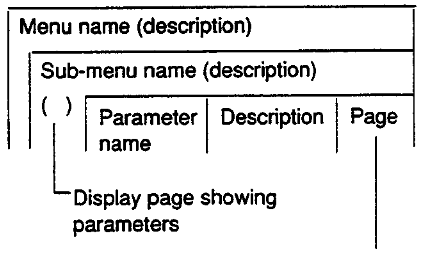
The memory function allows the user to set the camera's functions and parameters while referrring to the menus displayed on the viewfinder screen, thereby customizing the camera according to the application.

The memory function includes the following five different functions:

1. Reading a scene file
2. Storing a scene file
3. Setting a title
4. Set up (setting the camera's functions and parameters)
5. Self-diagnostic functions

List of menus, sub-menus and parameters

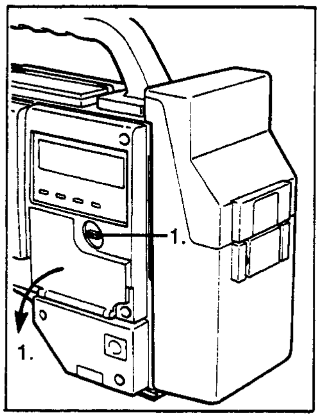
- Structure of the list

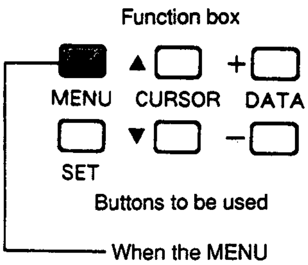


- This page number indicates the page in this instruction manual where the corresponding item is explained in detail.
- Parameters in the shaded areas can be stored on the memory card as a scene file.

	1 DATA READ (Reading a scene file)		
	File name to be read		33
	2 DATA WRITE (Storing a scene file)		
	File name to be stored		34
	3 TITLE SET (Setting a title)		
	1 EDIT (Composing a title)		
	Title, date on/off, time on/off		35
	2 CLEAR (Erasing a title)		
	NO parameter.		35
	4 SET UP (to check or alter the camera's functions and settings)		
	1 IRIS (Auto iris setting)		
	1 IRIS LEVEL	Iris level	37
	2 APB	APB function on/off	37
	3 PEAK/APL BAL	Mixing ratio of peak and average values	37
	4 IRIS AREA	Light measuring area	37
	5 IRIS SPEED	Response speed	37
	6 ALC F LIMIT	Video ALC operation start point	37
	2 PROCESS (Video signal setting)		
(1/2)	1 MASTER BLACK	Reference black level	38
	2 AUTO KNEE	Auto knee on/off	38
	3 KNEE LEVEL	Manual knee level	38
	4 ABL	Auto black level control on/off	38
	5 ABL LEVEL	ABL control level	38
	6 CONTOUR	Contour correction on/off	38
	7 CONTOUR LVL	Contour correction level	38
(2/2)	8 GAMMA	Gamma correction on/off	39
	9 GAMMA LEVEL	Gamma correction level	39
	3 OPERATION (Operating modes setting)		
(1/2)	1 GAIN	GAIN switch setting combinations	39
	2 AW FIL	Filter-linked auto white balance	39
	3 FULL TIME AW	Full-time auto white balance on/off	40
	4 AUDIO IND	Audio level indicator on/off	40
	5 VOICE ALARM	Audible warning messages on/off	40
	6 VTR SW	VTR start/stop trigger mode	40
	7 STATUS 1	Mode-1 status display setting	40
(2/2)	8 AUTO SET	AUTO switch function setting	40
	9 QREC MODE	Quick recording special mode on/off	40
	10 BATT. END	Battery warning voltage setting	40
	4 SYSTEM RESET (Initializing data) No parameter.		41
	5 CLOCK ADJUST (Date and time setting)		
	1 DISPLAY STYLE	Indications setting	41
	2 CORRECT	Correction	41
	5 SELF DIAGNOSTIC (Self-diagnostic functions)		
	(No parameter except for 2.)		
	• HOUR METER (Hour meter check)		42
	• MEMORY (Memory check)		42
	1 CARD MEMORY (Checking the memory card)		43
	2 VOICE ALARM (Checking the audible warnings)		
	Selecting English or Japanese		43
	3 AUTO CIRCUIT (Checking the automatic circuits)		43
	4 LED (Checking the LEDs)		43
	5 SW I/F CHECK (Checking the switches and buttons)		44
	CHAR MIX (Switching the character output from VIDEO/VTR OUT on/off)		44

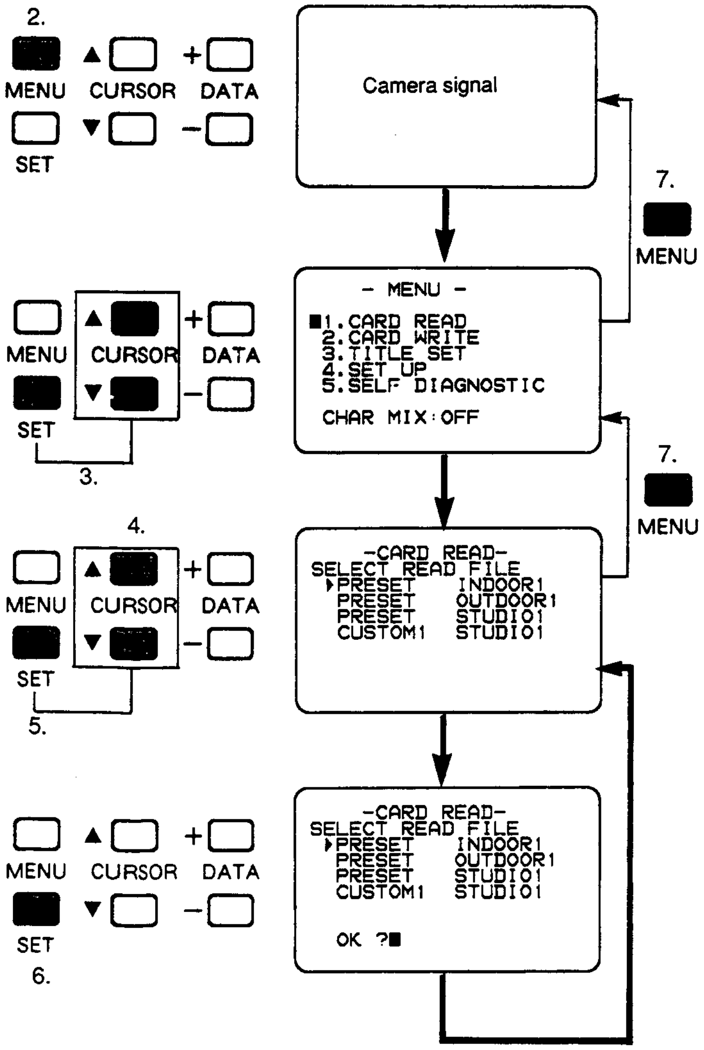
Reading a scene file




Function box
MENU
CURSOR
DATA
SET

Buttons to be used

When the MENU button is pressed during menu operation, the previous screen is recalled.


2.
MENU
CURSOR
DATA
SET
Camera signal
7.
MENU
- MENU -
■1.CARD READ
2.CARD WRITE
3.TITLE SET
4.SET UP
5.SELF DIAGNOSTIC
CHAR MIX:OFF
3.
7.
MENU
4.
-CARD READ-
SELECT READ FILE
▸PRESET INDOOR1
PRESET OUTDOOR1
PRESET STUDIO1
CUSTOM1 STUDIO1
5.
-CARD READ-
SELECT READ FILE
▸PRESET INDOOR1
PRESET OUTDOOR1
PRESET STUDIO1
CUSTOM1 STUDIO1
OK ?■
6.

- Camera settings stored on a memory card are read into the camera.
- Unless a memory card is installed, the following operations are not possible.
- For the memory card, see page 45.

1. Open the function box cover by pushing the unlock lever to the rear.

2. Press the MENU button.
   The MENU is displayed on the viewfinder screen, with the cursor (white square) blinking to the left of a number.

3. Make sure that the cursor is blinking against No.1, and press the SET button.
   - If the cursor is positioned against another number, move it to No.1 by pressing either the CURSOR "▲" or "▼" button, and then press the SET button.
     The sub-menu (CARD READ) will be displayed, with the names of all scene files stored in the memory card and related comments.

4. Press either CURSOR button to move the cursor (white triangle) to the desired file.

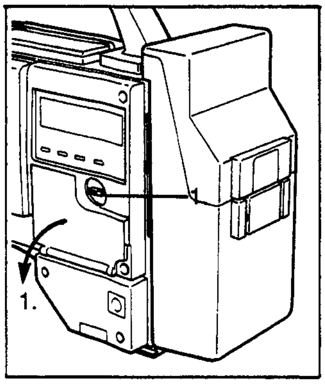
5. Press the SET button.
   "OK?" will appear at the bottom of the screen.

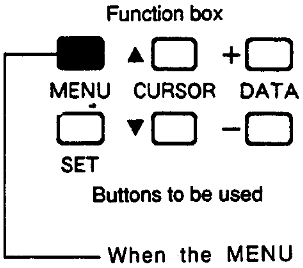
6. If you do not want to execute the command, press the MENU button. The screen will change to the sub-menu (CARD READ)
   To execute the command, press the SET button.
   The data will be read and, after showing the message "COMPLETE", the screen will change to the sub-menu (CARD READ).

7. To return to the original screen (camera signal), press the MENU button twice.

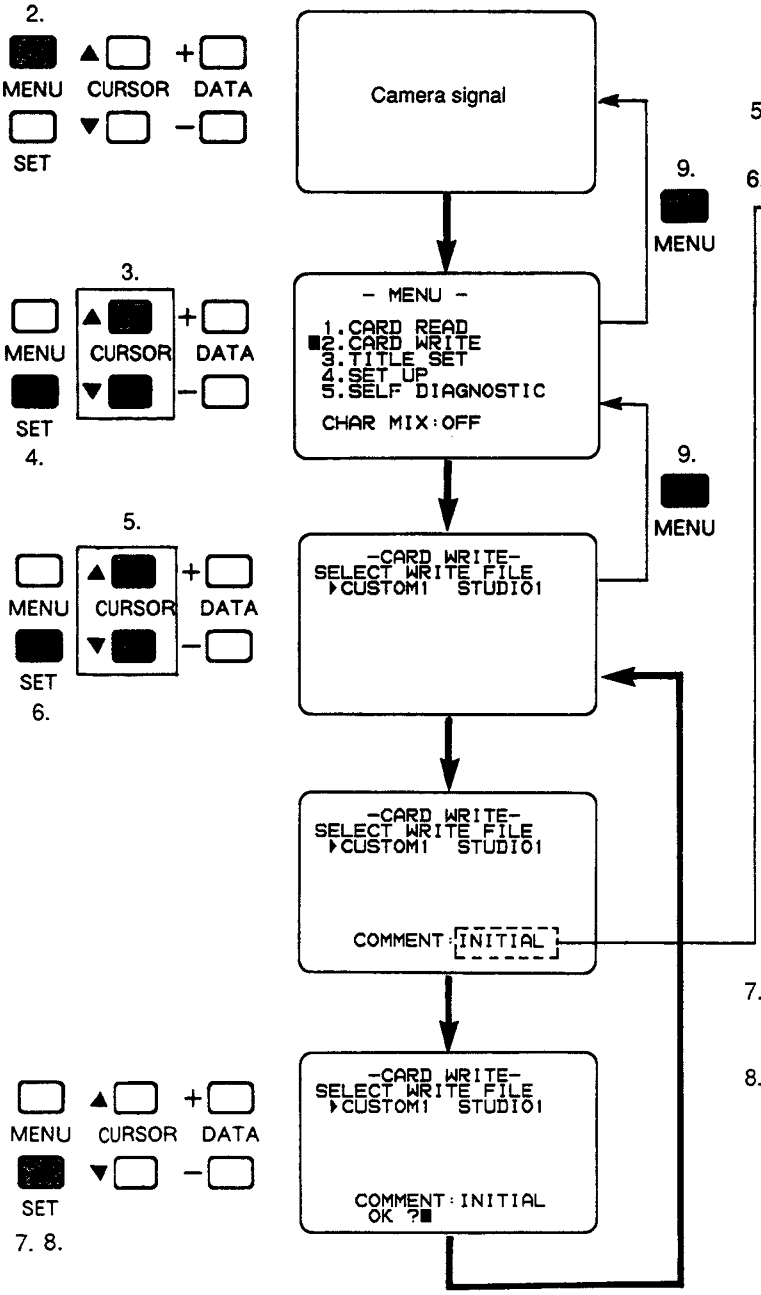
- When "CARD READ" has been executed, all the camera's "memorized" parameters will be rewritten.

Storing a scene file




Function box
MENU
CURSOR
DATA
SET
Buttons to be used

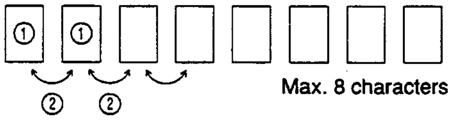
When the MENU button is pressed during menu operation, the previous screen is recalled.


2.
MENU
CURSOR
DATA
SET
3.
4.
5.
6.
7. 8.
9.
MENU
Camera signal
– MENU –
1.CARD READ
2.CARD WRITE
3.TITLE SET
4.SET UP
5.SELF DIAGNOSTIC
CHAR MIX:OFF
–CARD WRITE–
SELECT WRITE FILE
▸CUSTOM1 STUDIO1
COMMENT:INITIAL
OK ?■

- The camera settings currently set by the memory function can be stored on the memory card.
- Unless a memory card is installed, the following operations are not possible.
- For the memory card, see page 45.

1. Open the function box cover by pushing the unlock lever to the rear.
2. Press the MENU button.
   The MENU is displayed on the viewfinder screen, with the cursor (white square) blinking to the left of a number.
3. Press the CURSOR "▲" or "▼" button so that the cursor blinks against No.2.
4. Press the SET button.
   The sub-menu (CARD WRITE) will be displayed, with the names of custom scene files stored in the memory card and related comments.
5. Move the cursor (white triangle) to the desired file with either CURSOR button.
6. Press the SET button.
   The comment of the file to which the camera is currently set will appear and blink below the comment.
   - If a comment is not preset, a white line corresponding to the size of one character appears as a cursor.
   - When the data write command is executed, this blinking comment will replace the one selected in step 5.
   - You can rewrite the comment which is blinking.

To rewrite the comment


①
①
②
②
Max. 8 characters

① Change the blinking character with the DATA buttons.

□ ABCDEFGHIJKLMNOPQRS
TUVWXYZ0123456789. , :
?<>! '~+-*/%& (□ shows a space.)

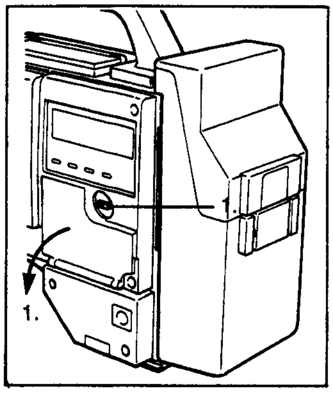
② Move the blinking position with the CURSOR buttons.
"▲": to move to the left (<---).
"▼": to mcve to the right (--->).

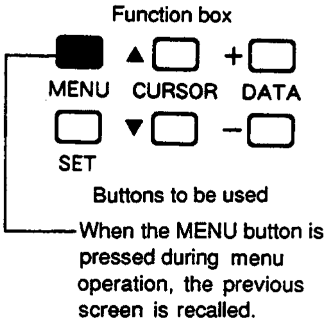
Repeat steps ① and ②.

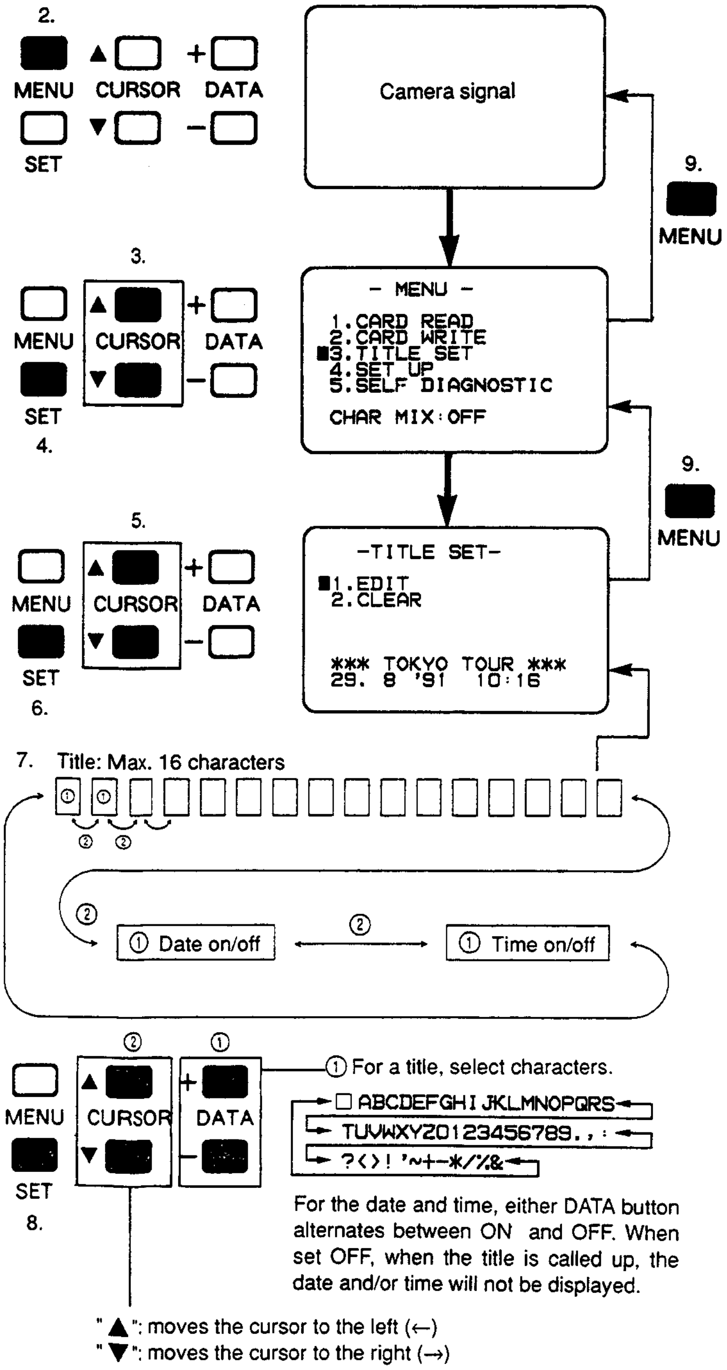
After completion, proceed to step 7.

7. Press the SET button.
   "OK?" will appear.
8. If you do not want to execute the command, press the MENU button. The sceen will change to the sub-menu (CARD WRITE).
   To execute the command, press the SET button.
   The data will be stored together with the comment and, after showing the message "COMPLETE", the screen will change to the sub-menu (CARD WRITE).
9. To return to the original screen (camera signal), press the MENU button twice.

Setting a title




Function box
▲ +
MENU CURSOR DATA
▼ −
SET
Buttons to be used
When the MENU button is pressed during menu operation, the previous screen is recalled.


2.
MENU CURSOR DATA
SET
3.
4.
5.
6.
7. Title: Max. 16 characters
① ①
② ②
②
① Date on/off
②
① Time on/off
8.
9.
MENU
9.
MENU
Camera signal
② ①
MENU CURSOR DATA
SET

```
- MENU -
 1.CARD READ
 2.CARD WRITE
■3.TITLE SET
 4.SET UP
 5.SELF DIAGNOSTIC
CHAR MIX:OFF
```

```
-TITLE SET-
■1.EDIT
 2.CLEAR

*** TOKYO TOUR ***
29. 8 '91  10:16
```

① For a title, select characters.

```
□ ABCDEFGHI JKLMNOPQRS
TUVWXYZ0123456789.,:
?<>! '~+-*/%&
```

For the date and time, either DATA button alternates between ON and OFF. When set OFF, when the title is called up, the date and/or time will not be displayed.

"▲": moves the cursor to the left (←)
"▼": moves the cursor to the right (→)

- The title composed here can be recorded together with the camera signal by pressing the TITLE button on the front of the camera. (See page 30.)

Composing a title

Compose a title and determine whether it should be displayed with or without the date, and with or without the time.

1. Open the function box cover by pushing the unlock lever to the rear.
2. Press the MENU button.
   The MENU is displayed on the viewfinder screen, with the cursor (white square) blinking to the left of a number.
3. Press the CURSOR "▲" or "▼" button so that the cursor blinks against No. 3.
4. Press the SET button.
   The sub-menu TITLE SET will be displayed.
5. Move the cursor to No. 1 with the CURSOR buttons.
6. Press the SET button.
   The currently set title will be displayed at the bottom of the screen, with the first character blinking.
7. The blinking character can be changed.
   ① Change the blinking character with the DATA buttons.
   ② Move the blinking position with the CURSOR buttons.
   Repeat steps ① and ②.
8. After composing the title, and determining date on/off and time on/off, press the SET button.
   The title will be stored.
9. To return to the original screen (camera signal), press the MENU button twice.

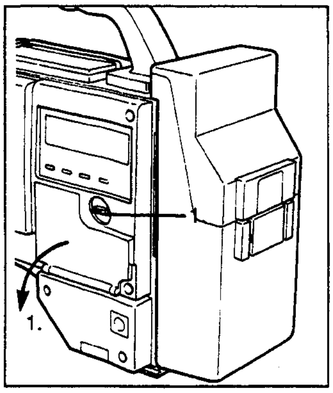
- The date display style can be changed. (See page 41.)
- To correct the date and time, see page 41.

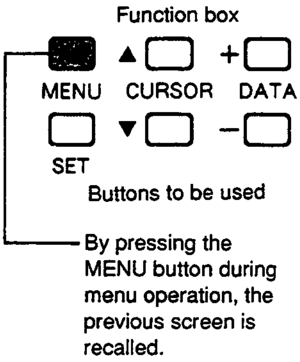
Erasing a title

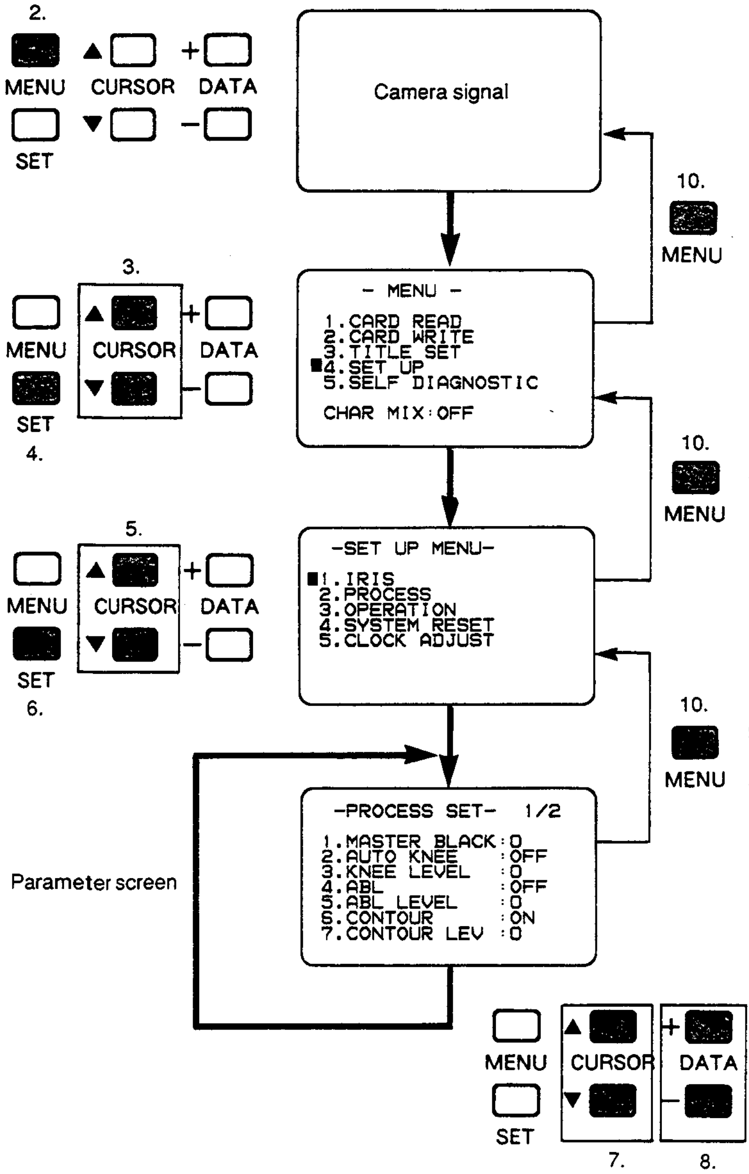
- Follow steps 1 through 4 in "Composing a title"

5. Move the cursor to No. 2 (CLEAR) with the CURSOR buttons.
6. Press the SET button.
   The title will be cleared. If you do not want to execute the command, press the MENU button instead of the SET button.
7. To return to the original screen (camera signal), press the MENU button twice.

SET UP (Setting camera's functions and parameters)




Function box
▲ +
MENU
CURSOR
DATA
▼ −
SET
Buttons to be used
By pressing the MENU button during menu operation, the previous screen is recalled.


2.
MENU CURSOR DATA
SET
Camera signal
10.
MENU
3.
4.
- MENU -
1.CARD READ
2.CARD WRITE
3.TITLE SET
■4.SET UP
5.SELF DIAGNOSTIC
CHAR MIX:OFF
5.
6.
-SET UP MENU-
■1.IRIS
2.PROCESS
3.OPERATION
4.SYSTEM RESET
5.CLOCK ADJUST
Parameter screen
-PROCESS SET- 1/2
1.MASTER BLACK:0
2.AUTO KNEE :OFF
3.KNEE LEVEL :0
4.ABL :OFF
5.ABL LEVEL :0
6.CONTOUR :ON
7.CONTOUR LEV :0
7.
8.

- Most of the data set using the SET UP MENU can be stored on the memory card.
- Setting is not possible when a title is on the screen, or during tape playback or recording.

Selection of menus and sub-menus

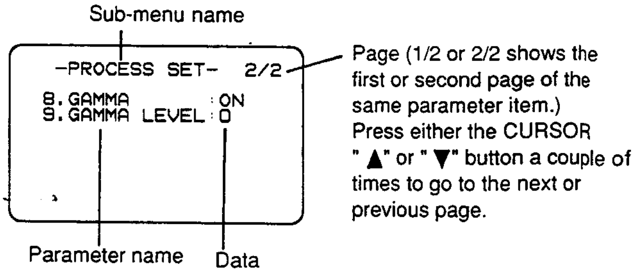
1. Open the function box cover by pushing the unlock lever to the rear.
2. Press the MENU button.
   The MENU is displayed on the viewfinder screen, with the cursor (white square) blinking to the left of a number.
3. Press the CURSOR "▲" or "▼" button so that the cursor blinks against No.4
4. Press the SET button.
5. Move the cursor to the desired item with the CURSOR "▲" or "▼" button.
6. Press the SET button.
   The parameter screen will be called up.

Altering parameter data

7. Select the parameter item with the CURSOR buttons.
   - The data of the selected parameter item will blink.
   - With some menus, there are two parameter pages. (See the figure.)
8. Set the data by pressing the DATA buttons.
   The DATA button functions in the following three ways according to the selected parameter:
   - Changes data in steps (eg. 0 dB → 9 dB → 18 dB).
   - Changes the analog value of the data (eg. –99 to +99).
     + : Increase
     – : Decrease
   - Switches on or off.
9. Repeat steps 7 and 8 as required.

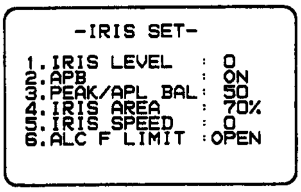
10. After completion of all settings, press the MENU button three times to return to the original screen (camera signal).

Structure of parameter screen


Sub-menu name
-PROCESS SET- 2/2
8.GAMMA :ON
9.GAMMA LEVEL:0
Page (1/2 or 2/2 shows the first or second page of the same parameter item.) Press either the CURSOR "▲" or "▼" button a couple of times to go to the next or previous page.
Parameter name
Data

Auto iris setting

- Master menu (MENU)
  4 SET UP
- Sub-menu
  (SET UP MENU)
  1 IRIS
- Parameter screen



```
      -IRIS SET-
1.IRIS LEVEL   : 0
2.APB          : ON
3.PEAK/APL BAL : 50
4.IRIS AREA    : 70%
5.IRIS SPEED   : 0
6.ALC F LIMIT  :OPEN
```

- For the procedure of selecting menus, see page 36.
- For the procedure of altering parameter data, see page 36.
- ◯ indicates data preset prior to shipment.

- **Iris level**

Parameter name	Data	
1.IRIS LEVEL	-99 to 99	(0)

The relationship between brightness and aperture in the auto iris mode can be set. The greater the value, the wider the aperture for a given brightness.

- **APB function on/off**

Parameter name	Data	
2.APB	ON·OFF	(OFF)

The APB function (see page 22) can be switched on or off.

ON: APB on. Automatically sets the mixing ratio of the detected peak and average levels.

OFF: APB off. The mixing ratio is determined by parameter 3 (PEAK/APL BAL).

- **Mixing ratio of peak and average values**

Parameter name	Data	
3.PEAK/APL BAL.	0 to 100	(30)

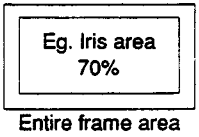
When parameter 2 (APB) is OFF, the mixing ratio of the detected peak and average levels for auto iris operation can be set.

The greater the value, the greater the weight of the peak level. "0" for average level only, and "100" for peak level only.

- **Light measuring area**

Parameter name	Data	
4.IRIS AREA	50%·60%·70%	(70%)

The light measuring area for auto iris operation can be set. The figure shows its percentage of the entire frame area. When this parameter is selected, the section of the screen corresponding to the light measuring area becomes lighter.



- **Response speed**

Parameter name	Data	
5.IRIS SPEED	-15 to 15	(0)

The auto iris response speed can be set. The greater the value, the higher the speed. Excessively high speeds may result in unstable operation.

- **Video ALC operation start point**

Parameter name	Data	
6.ALC F LIMIT	F5.6·F4.0·F2.8 F2.0·OPEN	(F2.0)

The lens aperture at which the Video ALC (see page 22) starts operating can be set.

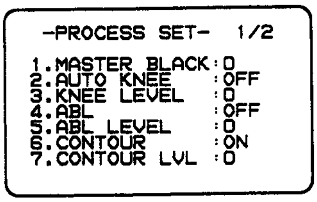
Important note:

If the power is switched off during memory setting operations, the data being set will not be stored in the memory. This means all parameters will require re-setting. Be sure to return to the camera signal screen before switching off the power.

Video signal setting

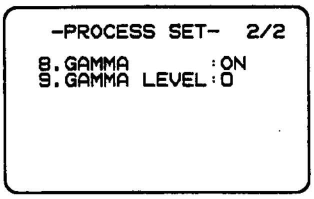
- Master menu (MENU)
  4 SET UP
- Sub-menu
  (SET UP MENU)
  2 PROCESS

- Parameter screen (1/2)



```
-PROCESS SET-   1/2
1.MASTER BLACK:0
2.AUTO KNEE   :OFF
3.KNEE LEVEL  :0
4.ABL         :OFF
5.ABL LEVEL   :0
6.CONTOUR     :ON
7.CONTOUR LVL :0
```

(2/2)



```
-PROCESS SET-   2/2
8.GAMMA       :ON
9.GAMMA LEVEL :0
```

- For the procedure of selecting menus, see page 36.
- For the procedure of altering parameter data, see page 36.
- ◯ indicates data preset prior to shipment.

- **Reference black level (Master black)**

Parameter name	Data
1.MASTER BLACK	-99 to 99

(0)

The master black level can be set.

- **Auto knee on/off**

Parameter name	Data
2.AUTO KNEE	ON·OFF

(ON)

When incident light exceeds 100%, the knee function compresses the portion of the video signal which corresponds to the over-lit section. The auto knee function varies the point at which signal compression starts according to the amount of incident light, ensuring good contrast even in bright areas of the picture.
The AUTO KNEE parameter switches the auto knee function on or off.

ON: Auto knee on. The compression start point is internaly determined.
OFF: Auto knee off. Signal compression always starts at a fixed point.

- **Manual knee level**

Parameter name	Data
3.KNEE LEVEL	-99 to 99

(0)

When parameter 2 (AUTO KNEE) is OFF, the point at which the video signal is compressed can be fine-adjusted. The greater the value, the higher the point with respect to the amount of incident light, in which case it is more difficult to obtain good contrast in bright areas of the picture.)

- **Auto black level control on/off**

Parameter name	Data
4.ABL	ON·OFF

(ON)

The ABL function can be switched on or off.
When the luminance level is high over the entire picture in outdoor shooting, the pictures contrast can be improved by lowering the black level slightly. The ABL performs this adjustment automatically.

ON: ABL on. Can be fine-adjusted by parameter 5 .
OFF: ABL off.

- **ABL control level**

Parameter name	Data
5.ABL LEVEL	-1·0·1

(0)

The automatically controlled black level can be fine-adjusted. The greater the value, the lower the black level for a given brightness, therefore the better the contrast.

- **Contour correction on/off**

Parameter name	Data
6.CONTOUR	ON·OFF

(ON)

Contour correction boosts the rising and falling portions of the video signal to produce sharper images.

ON: Contour correction on. Can be fine-adjusted by parameter 7.
OFF: Contour correction off. Original video signal.

- **Contour correction level**

Parameter name	Data
7.CONTOUR LVL	-99 to 99

(0)

The amount of contour correction can be set. The greater the value, the more the edges of images are emphasized, producing a garish picture.

Important note:

If the power is switched off during memory setting operations, the data being set will not be stored in the memory. This means all parameters will require re-setting. Be sure to return to the camera signal screen before switching off the power.

- **Gamma correction on/off**

Parameter name	Data	
8.GAMMA	ON・OFF	ON

ON: Gamma correction on. (Gamma ratio 0.45, can be fine-adjusted by parameter 9.)
OFF: Gamma correction off. (Gamma ratio 1)

- **Gamma correction level**

Parameter name	Data	
9.GAMMA LEVEL	−99 to 99	0

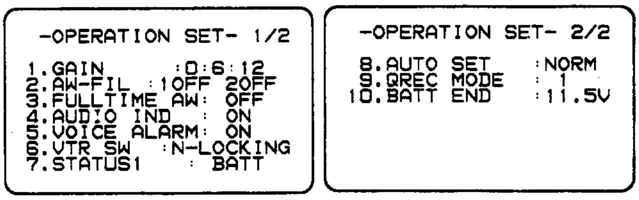
The gamma correction level can be set. The greater the value, the greater the amount of correction. For accurate adjustment, a waveform monitor, oscilloscope, or a reference chart is necessary. Normally do not adjust this parameter.

- For accurate adjustment, consult an authorized JVC Service agent.

Operation modes setting

- Master menu (MENU)
  4 SET UP
- Sub-menu
  (SET UP MENU)
  3 OPERATION

- Parameter screen (1/2) (2/2)



```
 -OPERATION SET- 1/2

1.GAIN        :0:6:12
2.AW-FIL  :1OFF 2OFF
3.FULLTIME AW:  OFF
4.AUDIO IND   :  ON
5.VOICE ALARM:  ON
6.VTR SW    :N-LOCKING
7.STATUS1     :  BATT
```

```
 -OPERATION SET- 2/2

 8.AUTO SET    :NORM
 9.QREC MODE   : 1
10.BATT END    :11.5V
```

- For the procedure of selecting menus, see page 36.
- For the procedure of altering parameter data, see page 36.
- ○ indicates data preset prior to shipment.

- **GAIN switch setting combinations**

Parameter name	Data	
1.GAIN	0:9:18・0:6:12 0:6:ALC 6:0:12・9:0:18	0:6:12

Sensitivities available in the three switch positions can be selected from among five combinations.

GAIN switch position	Selected data and sensitivity				
	0:9:18	0:6:12	0:6:ALC	6:0:12	9:0:18
●	0 dB	0 dB	0 dB	6 dB	9 dB
●●	9 dB	6 dB	6 dB	0 dB	0 dB
●●●	18 dB	12 dB	ALC	12 dB	18 dB

- **Filter-linked auto white balance**

Parameter name	Data	
2.AW-FIL	1OFF 2OFF 1ON 2OFF 1ON 2ON	1ON 2OFF

The filter-linked auto white balance mode can be switched on or off.

White balance mode	Selected data and mode on/off		
	1OFF 2OFF	1ON 2OFF	1ON 2ON
AUTO 1	Off	On	On
AUTO 2	Off	Off	On

Important note:

If the power is switched off during memory setting operations, the data being set will not be stored in the memory. This means all parameters will require re-setting. Be sure to return to the camera signal screen before switching off the power.

- **Full-time auto white balance on/off**

Parameter name	Data	
3.FULLTIME AW	ON·OFF	OFF

This parameter determines whether the full-time auto white balance mode is engaged or not when the W. BAL switch is set to AUTO 2.
ON: Full-time auto white balance in the AUTO 2 position.
OFF: Normal auto white balance.

- **Audio level indicator on/off**

Parameter name	Data	
4.AUDIO IND	ON·OFF	ON

This parameter determines whether the audio level indicator is to be displayed or not on the Mode-0 status display screen.
ON: Indicator on.
OFF: No indication.

- **Audible warning messages on/off**

Parameter name	Data	
5.VOICE ALARM	ON·OFF	ON

The audible warning messages can be defeated by this parameter.
ON: Messages on.
OFF: Messages off.

- **VTR start/stop trigger mode**

Parameter name	Data	
6.VTR SW	N-LOCKING LOCKING	N-LOCKING

Set this parameter according to the type of the VTR start/stop trigger on the lens.

N-LOCKING: Set this data for lenses with a momentary-type trigger (which stays ON only while it is being pressed, and is OFF when released.)
Applicable lense: HZ-714

LOCKING: Set this data for lenses with an alternating-type trigger (which goes ON when pressed, and OFF when pressed again.)
Applicable lense: HZ-713

- When using the HZ-713, an optional connector conversion adapter is necessary.

- **Mode-1 status display setting**

Parameter name	Data	
7.STATUS1	BATT·GAIN·FILTER SHUT·WB MODE	BATT

The item to be displayed on the Mode-1 status display screen can be selected.
BATT : Battey voltage
GAIN : Camera sensitivity
FILTER : Filter position
SHUT : Shutter speed
WB MODE : White balance mode

- **AUTO switch function setting**

Parameter name	Data	
8.AUTO SET	NORM·AB	NORM

This parameter determines the operation of the AUTO switch when it is pushed toward SETUP/BLK.
NORM: Automatic adjustment of black balance, white balance and black balance in succession.
AB : Automatic adjustment of black balance only.

- **Quick recording special mode on/off**

Parameter name	Data	
9.QREC MODE	1·2	①

1: Normal mode
2: Special mode (see page 26)

- **Battery warning voltage setting**

Parameter name	Data	
10.BATT END	11.0V to 12.0V	11.0

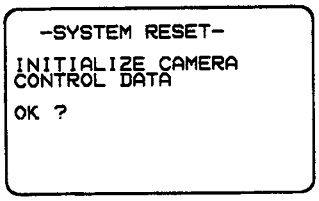
The voltage at which the battery warning starts operating.

Important note:

If the power is switched off during memory setting operations, the data being set will not be stored in the memory. This means all parameters will require re-setting. Be sure to return to the camera signal screen before switching off the power.

Initializing data

- Master menu (MENU)
  4 SET UP
- Sub-menu
  (SET UP MENU)
  4 SYSTEM RESET
- Parameter screen



```
-SYSTEM RESET-
INITIALIZE CAMERA
CONTROL DATA
OK ?
```

- For the procedure of selecting menus, see page 36.

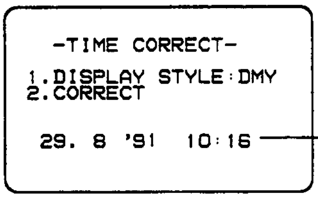
When this menu is selected, the message shown above appears.

- If you do not want to initialize data, press the MENU button. The screen will return to the sub-menu (SET UP MENU).
- If you want to initialize data, press the SET button. After completion of initialization, a message "COMPLETE" will appear.

- After performing initialization, all the parameters set using the memory function will be reset to the data preset prior to shipment. Be very careful when using this function.
- The following data is protected and will not be reset by initialization:
  Display style of date and time and correction (See below).
  Language of audible warning messages (English/ Japanese) (See page 43)
- After initialization has been executed, the scene file name on the Mode-2 status display will change to "PRESET INITIAL".

Date and time setting

- Master menu (MENU)
  4 SET UP
- Sub-menu
  (SET UP MENU)
  5 CLOCK ADJUST
- Parameter screen



```
-TIME CORRECT-
1.DISPLAY STYLE:DMY
2.CORRECT

29. 8 '91   10:16
```

Currently set date and time

- For the procedure of selecting menus, see page 36.

- **Indications setting**

Parameter name	Data
1.DISPLAY STYLE	MDY·YMD·DMY

DMY

The method of displaying the date in titles or on the Mode-2 status display screen can be selected.

MDY:	In the order month, day and year. e.g. 8.29 '91
YMD:	In the order year, month and day. e.g. '91 8.29
DMY:	In the order day, month and year. e.g. 29.8 '91

- **Correction**

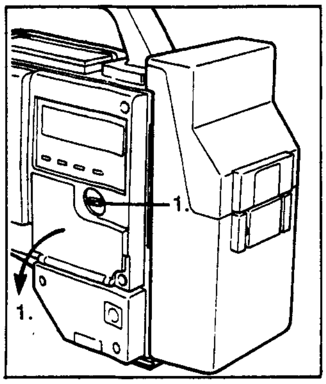
Parameter name	Data
2.CORRECT	

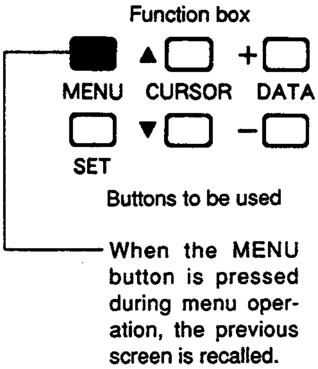
When this parameter is selected, the cursor (white square) appears at the parameter number and blinks.

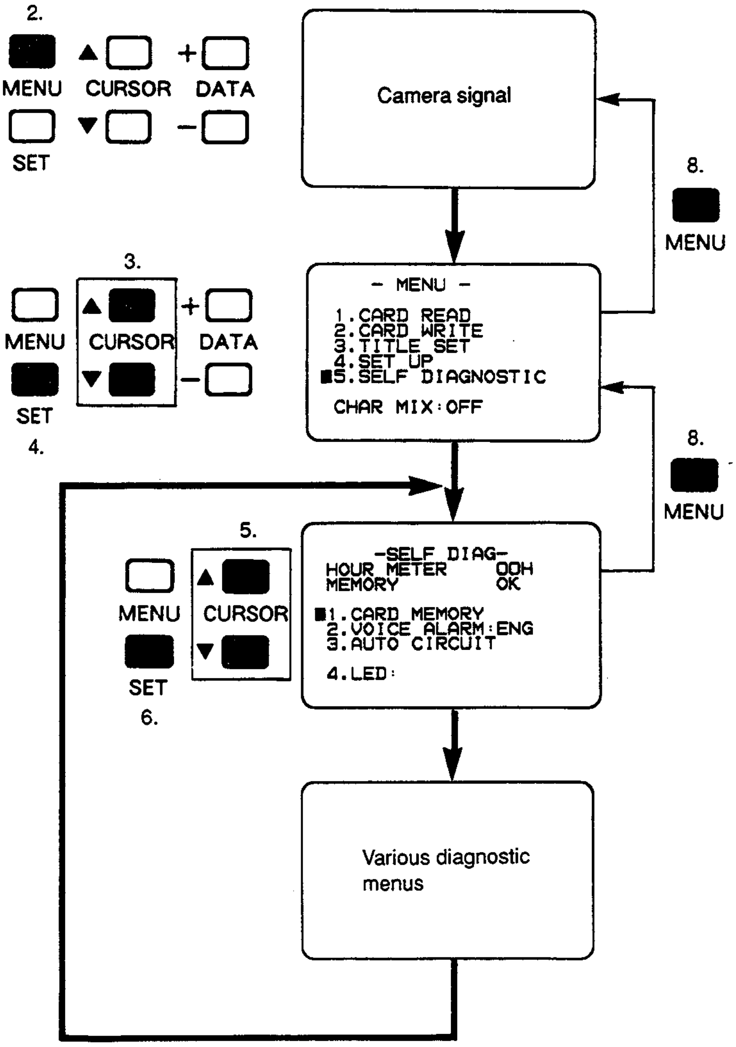
Correction procedure

1. Press the SET button.
2. Correct the blinking digits with the DATA buttons.
   The sequence of the date and time indication differs depending on the selected display style.
   MDY: Month, day, year, hour, minute
   YMD: Year, month, day, hour, minute
   DMY: Day, month, year, hour, minute
3. Move the blinking position with the CURSOR buttons.
   "▲" button: to move in the direction of right.
   "▼" button: to move in the direction of left.
4. Repeat steps 2 and 3 as required.
5. After setting all the items (year, month, day, hour, minute), press the SET button.

Self-diagnostic functions




Function box
MENU
CURSOR
DATA
SET
Buttons to be used
When the MENU button is pressed during menu operation, the previous screen is recalled.


2.
MENU
CURSOR
DATA
SET
Camera signal
8.
MENU
3.
MENU
CURSOR
DATA
SET
4.
- MENU -
1.CARD READ
2.CARD WRITE
3.TITLE SET
4.SET UP
■5.SELF DIAGNOSTIC
CHAR MIX:OFF
8.
MENU
5.
MENU
CURSOR
SET
6.
-SELF DIAG-
HOUR METER 00H
MEMORY OK
■1.CARD MEMORY
2.VOICE ALARM:ENG
3.AUTO CIRCUIT
4.LED:
Various diagnostic menus

- The self-diagnostic functions let you check whether the camera's circuits are operating properly.

Selection of the menu and sub-menu

1. Open the function box cover by pushing the unlock lever to the rear.
2. Press the MENU button.
   The MENU is displayed on the viewfinder screen, with the cursor (white square) blinking to the left of a number.
3. Press the CURSOR "▲" or "▼" button so that the cursor blinks against No. 5.
4. Press the SET button.
   The sub-menu SELF DIAG will be displayed.
5. Move the cursor to the desired item with the CURSOR buttons.
6. Press the SET button.
   The selected mode will be engaged. (See the next page.)
7. Repeat steps 5 and 6 as required.
8. To return to the original screen (camera signal), press the MENU button twice.

Checking the hour meter and the memory

These two items can be checked on the SELF DIAG screen. The sub-menu need not be called up.

- HOUR METER
  Indicates the total running hours of the VTR in steps of 10 hours. Use this as a reference for scheduling maintenance.
- MEMORY
  Indicates the condition of the built-in EPROM (program memory): "OK" when it is normal, and "NG" if there is a failure. If "NG" appears, consult an authorized JVC Service agent.

Checking the memory card

- Unless a memory card is installed, this function cannot be used.
- Call up the SELF DIAG menu. (Steps 1 through 4 on the previous page.)

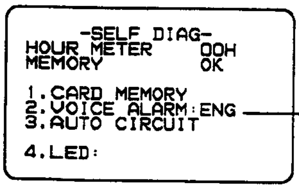
1. Select 1. CARD MEMORY.
   (Steps 5 and 6 on the previous page.)
2. Check the message.
   OK : The memory card is normal.
   NG : The memory card is defective.
3. The screen will return to the sub-menu automatically.

> If "NG" is displayed, check again after making sure that the memory card is installed correctly. If it fails again, consult an authorized JVC Service agent.

Checking the audible warnings

- Call up the SELF DIAG menu. (Steps 1 through 4 on the previous page.)

1. Select 2. VOICE ALARM.
   (Steps 5 and 6 on the previous page.)
2. Voice messages will be output from the monitor speaker, repeatedly in the order: "VTR warning.", "End of tape." and "Low battery."
   - By pressing either DATA button in this status, the language alternates between Japanese and English.
   - The language selected can also be checked on the screen.



```
     -SELF DIAG-
HOUR METER        00H
MEMORY            OK

1.CARD MEMORY
2.VOICE ALARM:ENG
3.AUTO CIRCUIT

4.LED:
```

JPN : Japanese
ENG : English

3. Press the MENU button to return to the sub-menu.

Checking the automatic circuits

- The white and black balance adjustment circuits can be checked.
- Call up the SELF DIAG menu. (Steps 1 through 4 on the previous page.)

1. Shoot a black and white object.
2. Select 3. AUTO CIRCUIT.
   (Steps 5 and 6 on the previous page.)
   The diagnostic process will start automatically. It will take about 1.5 minutes for it to be completed. After completion, the screen will return to the sub-menu automatically.
   - The diagnostic process includes 5 steps. These steps will be followed in sequence. After each step, a message indicating whether each item is normal or defective will appear and it will proceed to the next step.
   - Possible messages are as follows:
     AW R OK/NG (R channel auto white is normal/defective)
     AW B OK/NG (B channel auto white is normal/defective)
     AB R OK/NG (R channel auto black is normal/defective)
     AB G OK/NG (G channel auto black is normal/defective)
     AB B OK/NG (B channel auto black is normal/defective)

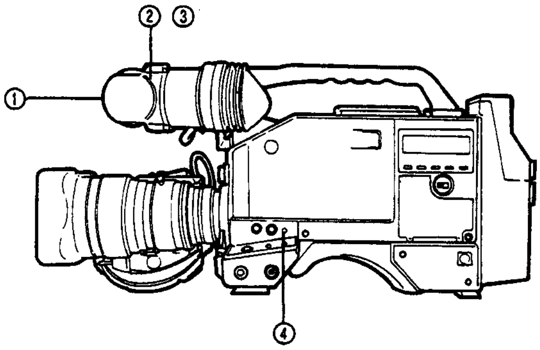
> **- If this checking is performed while a coloured object is being shot, AW R NG and AW B NG may appear on the screen. Be careful.**
> **- If these messages are displayed, take a note and consult an authorized JVC Service agent.**

- To stop the diagnostic process, press the MENU button. The screen will return to the sub-menu.

Checking the LEDs

- Call up the SELF DIAG menu. (Steps 1 through 4 on the previous page.)

1. Select 4. LED.
   (Steps 5 and 6 on the previous page.)
   "ALL ON" will be displayed.
2. Check the following points:
   ① Whether the tally is on.
   (The TALLY switch of the viewfinder must be set to ON.)
   ② Whether the BATT indicator (red) inside the eyepiece is on.
   ③ Whether the REC/ALARM indicator (green) inside the eyepiece is on.
   ④ Whether the SHUTTER indicator is on.



3. Press the MENU button to return to the sub-menu.

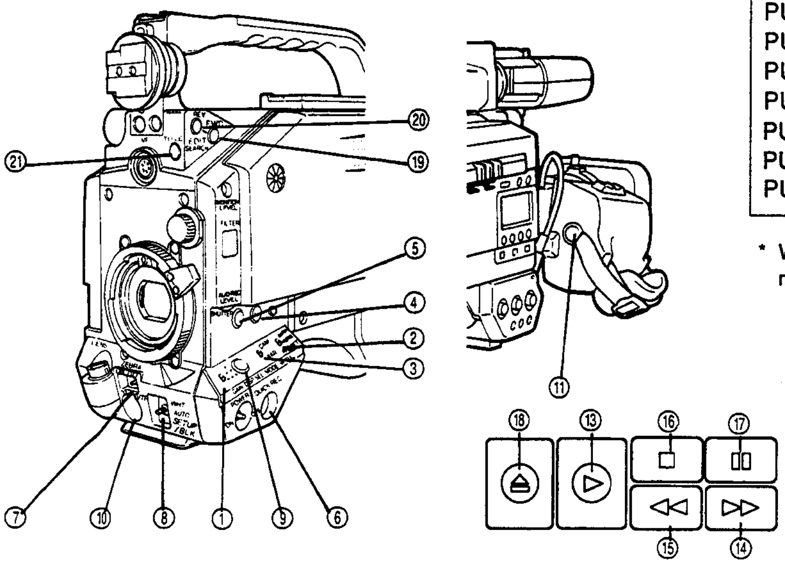
> If any indicator fails to light, consult an authorized JVC Service agent.

Checking the switches and buttons

- Call up the SELF DIAG menu. (Steps 1 through 4 on page 42.)

1. Select 5. SW I/F CHECK.
   (Steps 5 and 6 on page 42.)
2. Operate the switches and buttons according to the messages.
   - If you operate an incorrect switch or button, "NG" will appear.
   - When you operate the correct switch or button, "OK" will appear. After "OK", the next item will be selected automatically. After completion of all items, the screen will return to the sub-menu automatically.
   - If you want to stop this checking midway, press the MENU button. The screen will change to the sub-menu.
   - If you want to skip some items, press the SET button.

> If "NG" appears when the correct switch or button is operated, consult a JVC Service agent.



List of messages and operations

Messages (in sequence)	Switch position	Operation
SELECT GAIN ●	*①	●
SELECT GAIN ●●	*①	●●
SELECT GAIN ●●●	*①	●●●
SELECT WB: AUTO1	*②	AUTO1
SELECT WB: AUTO2	*②	AUTO2
SELECT WB: PRESET	*②	PRESET
SELECT MODE: BARS	*③	BARS
SELECT MODE: CAM	*③	CAM
PUSH SHUTTER: ON	④	Push
PUSH SHUTTER: NOR	⑤	Push
PUSH QREC	⑥	Push
SELECT ZEBRA: ON	*⑦	ON
SELECT ZEBRA: OFF	*⑦	OFF
PUSH AUTO SET	⑧	Push down
PUSH AUTO WHITE	⑧	Push up
PUSH DISP SELECT	⑨	Push
PUSH VTR TRIG	⑩	Push
PUSH LENS VTR	⑪	Push
PUSH PLAY	⑬	Push
PUSH FF	⑭	Push
PUSH REW	⑮	Push
PUSH STOP	⑯	Push
PUSH STILL	⑰	Push
PUSH EJECT	⑱	Push
PUSH EDIT FWD	⑲	Push
PUSH EDIT REV	⑳	Push
PUSH TITLE	㉑	Push

* With some switch settings, messages may not appear or the order may be different.

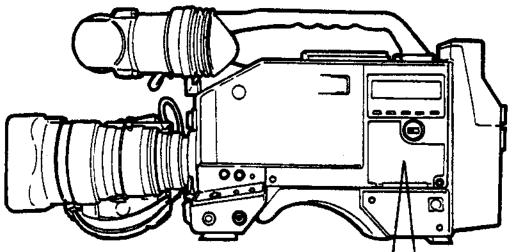
Switching the character output from VIDEO/VTR OUT on/off

It is possible to output the character display on the viewfinder screen (status display, memory function menus, etc.) from the VIDEO OUT connector together with the camera signal. The character display is also mixed with the EE signal from the VTR OUT connector.

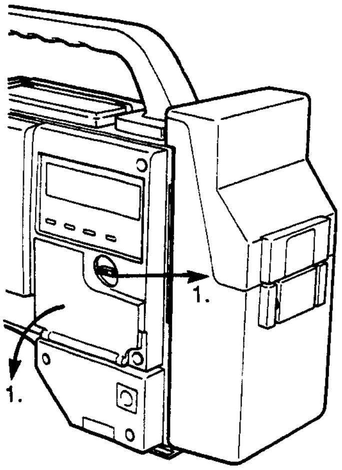
1. Open the function box lid.
2. Press the MENU button.
3. Press the CURSOR "▲" button.
4. Press the DATA "+" button.
5. Press the MENU button. The screen will return to the original (camera signal).

- To cancel this mode, follow steps 1 through 5.
- When the power is switched on, this setting is cancelled automatically.
- When recording is started, this mode is cancelled automatically.

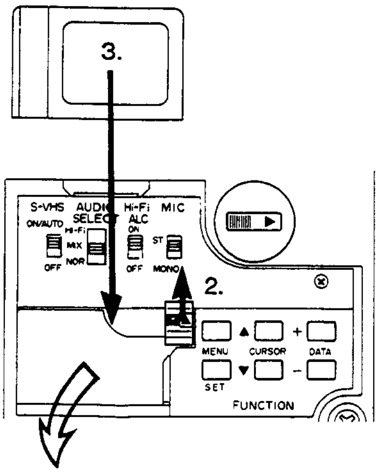
ADVANCED MEMORY SYSTEM (AMS)



Installing a memory card



1. Open the function box cover by pushing the unlock lever to the rear.



2. Push up the memory card eject lever. The compartment will open.
3. Install a memory card with its terminals towards the camera.

Removing the memory card
After opening the compartment as described in steps 1 and 2, remove the memory card.

The AMS system allows camera settings to be retained as scene files on a memory card so that they can be recalled whenever necessary.

If you keep a number of files according to shooting purposes, you will be able to respond promptly to a variety of applications.

Scene files
A scene file refers to a set of data consisting of camera settings and adjustments preset by the memory function. Each individual data item in the scene file is referred to as a parameter.
There are two types of scene files: preset scene files in which the parameters are preset according to shooting conditions, and custom files into which the user can write his own settings of parameters.

- For the list of the parameters contained in scene files, refer to the next page.
- With some parameters, data is not compatible, even between two GY-X1 units.

To make a custom scene file:
The parameters data in the preset scene files can be changed by the user, and the resulting parameter settings can be stored as a custom scene file.

① Read the preset scene file which seems closest to the intended shooting application.
② Change the parameters as required.
③ Store the rewritten file as a custom scene file.
  - The rewritten file cannot be stored as a preset scene file.
  - For reading and storing scene files, see pages 33 and 34. For changing parameters data, see page 36.

Provided memory card
The provided memory card contains the following four scene files:

① PRESET INDOOR
② PRESET OUTDOOR
③ PRESET STUDIO1
④ CUSTOM1

Custom scene file ④ hold data corresponding to the initial settings preset prior to shipment. This can be rewritten by the user.

Preset scene files

The parameter data of the preset scene files are shown here. Take advantage of these when making custom scene files.

- Parameter data may be changed to improve response.
- With parameters indicated by [▭], data is not compatible, even between two GY-X1 units. Therefore, reading a custom scene file from a memory card preset by a different unit will not guarantee the same effects.

- Structure of the list

Sub-menu name		
Parameter name	Description	Data

- For more details of parameters, refer to "MEMORY FUNCTION" on page 32.

PRESET INDOOR

Settings suitable for indoor shooting.

IRIS (Auto iris setting)			
	1 IRIS LEVEL	Iris level	0
	2 APB	APB function on/off	ON
	3 PEAK/APL BAL	Mixing ratio of peak and average values	30
	4 IRIS AREA	Light measuring area	60%
	5 IRIS SPEED	Response speed	0
	6 ALC F LIMIT	Video ALC operation start point	F2.0
PROCESS (Video signal setting)			
(1/2)	1 MASTER BLACK	Reference black level	0
	2 AUTO KNEE	Auto knee on/off	ON
	3 KNEE LEVEL	Manual knee level	0
	4 ABL	Auto black level control on/off	ON
	5 ABL LEVEL	ABL control level	0
	6 CONTOUR	Contour correction on/off	ON
	7 CONTOUR LVL	Contour correction level	20
(2/2)	8 GAMMA	Gamma correction on/off	ON
	9 GAMMA LEVEL	Gamma correction level	0
OPERATION (Operating modes setting)			
(1/2)	1 GAIN	GAIN switch setting combinations	0, 6,12
	2 AW FIL	Filter-linked auto white balance	1ON2OFF
	3 FULL TIME AW	Full-time auto white balance on/off	OFF
	4 AUDIO IND	Audio level indicator on/off	ON
	5 VOICE ALARM	Audible warning messages on/off	ON
	6 VTR SW	VTR start/stop trigger mode	N-LOCKING
	7 STATUS 1	Mode-1 status display setting	BATT
	8 AUTO SET	AUTO switch functions setting	NORM
(2/2)	9 QREC MODE	Quick recording special mode on/off	1
	10 BATT END	Battery warning voltage setting	11.0

PRESET OUTDOOR

Settings suitable for outdoor shooting.

IRIS (Auto iris setting)			
	1 IRIS LEVEL	Iris level	0
	2 APB	APB function on/off	ON
	3 PEAK/APL BAL	Mixing ratio of peak and average values	30
	4 IRIS AREA	Light measuring area	50%
	5 IRIS SPEED	Response speed	0
	6 ALC F LIMIT	Video ALC operation start point	F2.0
PROCESS (Video signal setting)			
(1/2)	1 MASTER BLACK	Reference black level	0
	2 AUTO KNEE	Auto knee on/off	ON
	3 KNEE LEVEL	Manual knee level	0
	4 ABL	Auto black level control on/off	ON
	5 ABL LEVEL	ABL control level	1
	6 CONTOUR	Contour correction on/off	ON
	7 CONTOUR LVL	Contour correction level	40
(2/2)	8 GAMMA	Gamma correction on/off	ON
	9 GAMMA LEVEL	Gamma correction level	0
OPERATION (Operating modes setting)			
(1/2)	1 GAIN	GAIN switch setting combinations	0, 6,12
	2 AW FIL	Filter-linked auto white balance	1ON2OFF
	3 FULL TIME AW	Full-time auto white balance on/off	OFF
	4 AUDIO IND	Audio level indicator on/off	ON
	5 VOICE ALARM	Audible warning messages on/off	ON
	6 VTR SW	VTR start/stop trigger mode	N-LOCKING
	7 STATUS 1	Mode-1 status display setting	BATT
	8 AUTO SET	AUTO switch functions setting	NORM
(2/2)	9 QREC MODE	Quick recording special mode on/off	1
	10 BATT END	Battery warning voltage setting	11.0

PRESET STUDIO 1

Settings suitable for studio shooting.

IRIS (Auto iris setting)			
	1 IRIS LEVEL	Iris level	0
	2 APB	APB function on/off	OFF
	3 PEAK/APL BAL	Mixing ratio of peak and average values	30
	4 IRIS AREA	Light measuring area	70%
	5 IRIS SPEED	Response speed	0
	6 ALC F LIMIT	Video ALC operation start point	F2.0
PROCESS (Video signal setting)			
(1/2)	1 MASTER BLACK	Reference black level	0
	2 AUTO KNEE	Auto knee on/off	OFF
	3 KNEE LEVEL	Manual knee level	0
	4 ABL	Auto black level control on/off	OFF
	5 ABL LEVEL	ABL control level	0
	6 CONTOUR	Contour correction on/off	ON
	7 CONTOUR LVL	Contour correction level	0
(2/2)	8 GAMMA	Gamma correction on/off	ON
	9 GAMMA LEVEL	Gamma correction level	0
OPERATION (Operating modes setting)			
(1/2)	1 GAIN	GAIN switch setting combinations	0, 6,12
	2 AW FIL	Filter-linked auto white balance	1ON2OFF
	3 FULL TIME AW	Full-time auto white balance on/off	OFF
	4 AUDIO IND	Audio level indicator on/off	OFF
	5 VOICE ALARM	Audible warning messages on/off	ON
	6 VTR SW	VTR start/stop trigger mode	N-LOCKING
	7 STATUS 1	Mode-1 status display setting	GAIN
	8 AUTO SET	AUTO switch functions setting	NORM
(2/2)	9 QREC MODE	Quick recording special mode on/off	1
	10 BATT END	Battery warning voltage setting	11.0

Custom scene memo file

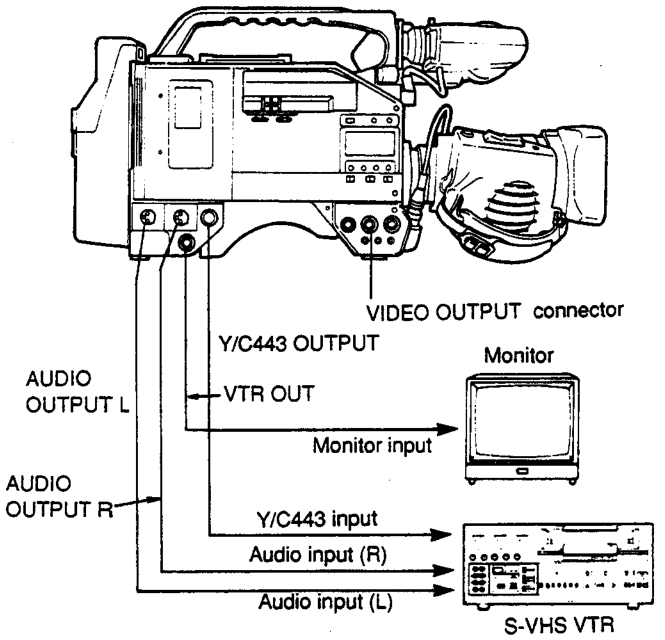
Copy this memo file and use it as a memo of your own scene file.

- Memory card No. (   )
- CUSTOM (   )   • Comment (   )

IRIS (Auto iris setting)			
	1 IRIS LEVEL	Iris level	
	2 APB	APB function on/off	
	3 PEAK/APL BAL	Mixing ratio of peak and average values	
	4 IRIS AREA	Light measuring area	
	5 IRIS SPEED	Response speed	
	6 ALC F LIMIT	Video ALC operation start point	
PROCESS (Video signal setting)			
(1/2)	1 MASTER BLACK	Reference black level	
	2 AUTO KNEE	Auto knee on/off	
	3 KNEE LEVEL	Manual knee level	
	4 ABL	Auto black level control on/off	
	5 ABL LEVEL	ABL control level	
	6 CONTOUR	Contour correction on/off	
	7 CONTOUR LVL	Contour correction level	
(2/2)	8 GAMMA	Gamma correction on/off	
	9 GAMMA LEVEL	Gamma correction level	
OPERATION (Operating modes setting)			
(1/2)	1 GAIN	GAIN switch setting combinations	
	2 AW FIL	Filter-linked auto white balance	
	3 FULL TIME AW	Full-time auto white balance on/off	
	4 AUDIO IND	Audio level indicator on/off	
	5 VOICE ALARM	Audible warning messages on/off	
	6 VTR SW	VTR start/stop trigger mode	
	7 STATUS 1	Mode-1 status display setting	
	8 AUTO SET	AUTO switch functions setting	
(2/2)	9 QREC MODE	Quick recording special mode on/off	
	10 BATT END	Battery warning voltage setting	

USING AS A STUDIO CAMERA

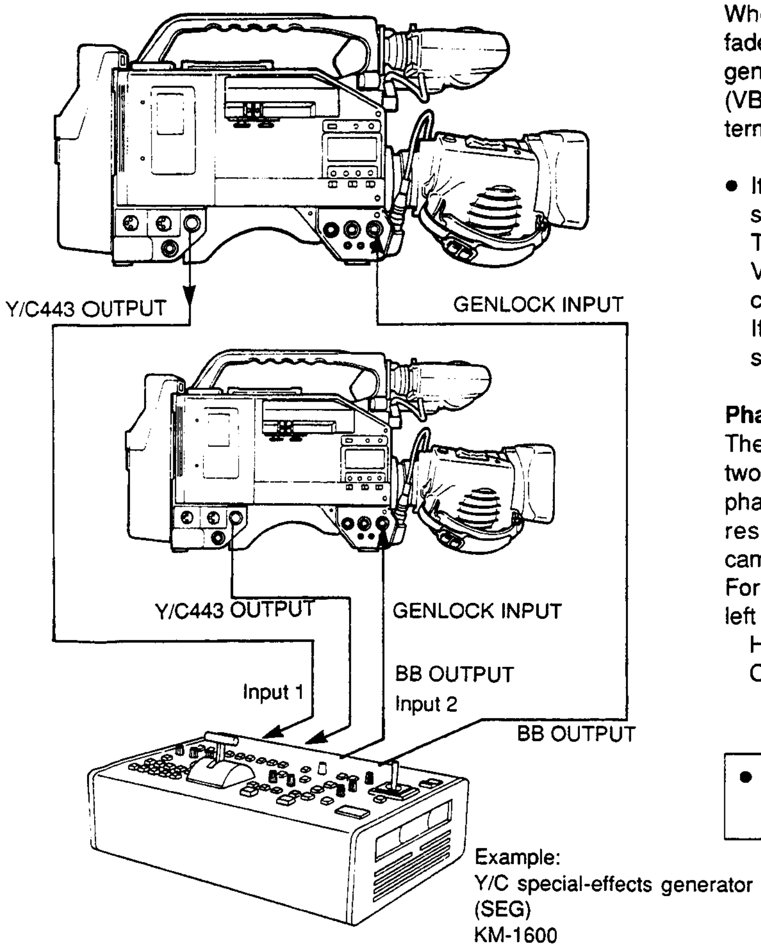
Connection to an external VTR and audio equipment


VIDEO OUTPUT connector
Y/C443 OUTPUT
Monitor
AUDIO OUTPUT L
VTR OUT
Monitor input
AUDIO OUTPUT R
Y/C443 input
Audio input (R)
Audio input (L)
S-VHS VTR

When recording the signals being shot with this unit onto another VTR, connect as illustrated on the left.

- When using a VHS VTR (not S-VHS), the use of the VIDEO OUT connector is recommended. (GY-X1TC only)
- The VITC time code can be inserted into the signal output from the VIDEO OUT connector. (GY-X1TC only)
- The start/stop trigger signal cannot be delivered to the external VTR.

Genlocking (provided only on the GY-X1 TC)


Y/C443 OUTPUT
GENLOCK INPUT
Y/C443 OUTPUT
GENLOCK INPUT
BB OUTPUT
Input 1
Input 2
BB OUTPUT
Example:
Y/C special-effects generator
(SEG)
KM-1600

When multiple camera signals are processed via an SEG for fades, mixes, wipes, etc., all cameras must be synchronized by genlocking. For this purpose, apply a composite video signal (VBS) or black burst (BB) to the camera's GENLOCK INPUT terminal.

- It is not possible to genlock this unit with the VTR playback signal. This could cause a sync failure or hue fluctuations. This is not due to any defect of the unit, but because the VTR playback signal contains timebase errors corresponding to the rotary system's wow and flutter.
  If the VTR playback signal is to be used as a reference signal, correct it using a timebase corrector.

Phase adjustment
The figure shows an example of a camera-SEG system. When two or more cameras are used, the horizontal phase and color phase of their output signals must coincide with each other with respect to the reference signal externally applied to the cameras.
For adjusment, use the following switches and controls on the left side of the camera.

Horizontal sync phase: H control
Color sync phase: Coarse switch 0, 120°, 240°
FINE control ±60°

- For adjustments, consult the dealer from whom you purchased this unit or an authorized JVC Service agent.

TIME CODE RECORDING (GY-X1TC only)

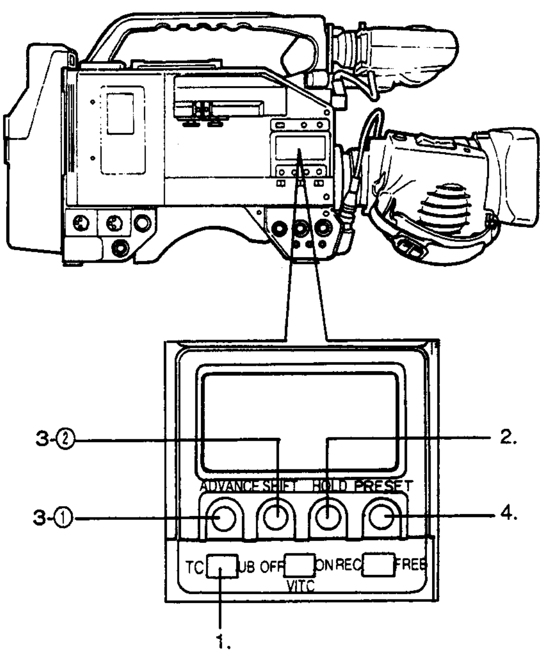
The GY-X1TC is capable of recording time codes together with the video signal. Tapes with time codes are effective for subsequent use in A/B roll editing.

The GY-X1TC employs the VITC system which records time codes in the vertical blanking period. Time codes include time data and user's bits, which are set independently.

The time code specifications of this unit are as follows:
- Insertion period: line 13H or 15H
- Frame mode: Drop frame

To change the insertion period and frame mode, consult an authorized JVC service agent.

Setting the user's bits



Usable characters and display

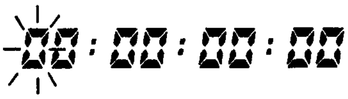
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F

The user's bits are an 8-digit number which is recorded together with time data on the tape, to be used for tape management.

For each digit, numerals 0 through 9 and characters A through F can be used.

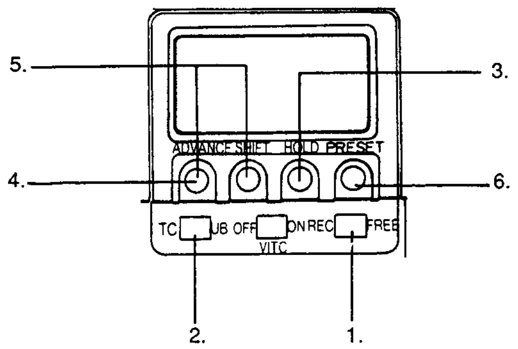
- The user's bits need not be set. If not required, proceed to "Time data setting".

1. Set the TC/UB switch to UB.
2. Press the HOLD button.
   The following display will appear with the left-most character blinking.



3. The blinking character can be changed.
   ①Set the character with the ADVANCE button.
   ②Move to the next character with the SHIFT button.
   Repeat steps ① and ② to set all the user's bits.
4. After setting the data, press the PRESET button.

Time data setting



Set the time data to be recorded.

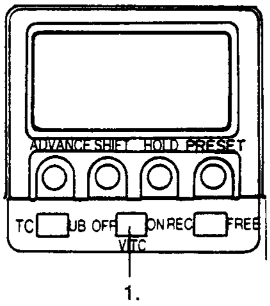
1. Set the REC RUN/FREE RUN switch as required.
   - REC RUN: Time codes count up only while the VTR is recording. Continuous data is available.
   - FREE RUN: Time codes count up when setting is completed (in step 6) and continues counting. Therefore, the time codes recorded on the tape are not continuous. Use this mode when you want to record real-time data on the tape. (Counting stops when the power is switched off. Be careful.)
2. Set the TC/UB switch to TC.
3. Press the HOLD button.
   The 10s hour digit will blink.
4. Set the data with the ADVANCE button.
5. Move to the next digit with the SHIFT button and set the data with the ADVANCE button.

6. After all digits (hour, minute, second, frame) have been set, press the PRESET button.
   - Counting starts immediately if the REC RUN/FREE RUN switch has been set to FREE RUN in step 1.

- To change the setting, repeat steps from 3.
- If you have pressed the HOLD button by accident, press it again to return to the previous status.

Recording time codes

1. Set the VITC switch to ON.
2. - With the REC RUN position selected, counting starts when the VTR starts recording, and stops when it stops recording.
   - With the FREE RUN position selected, counting starts immediately after the time data has been preset. Whenever the VTR is recording, real-time time data is recorded.
     (Counting stops when the power is switched off. Be careful.)

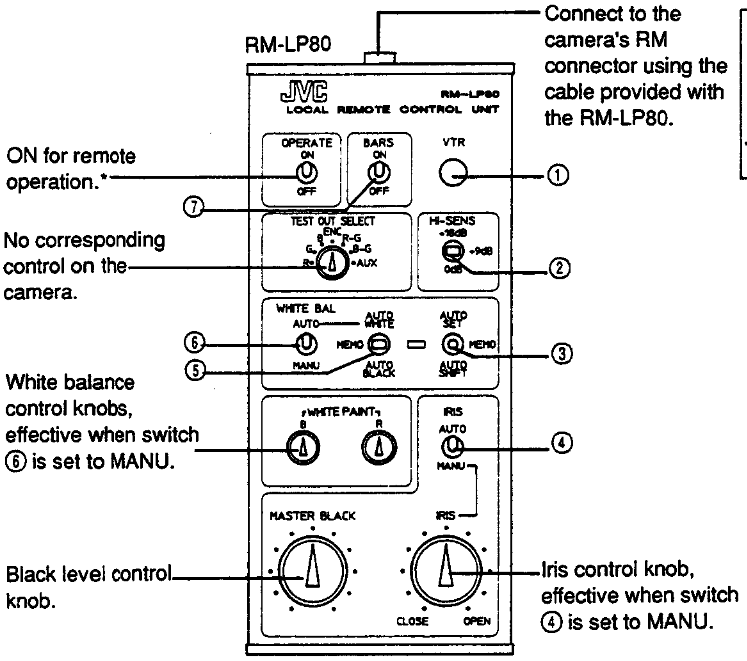


Notes

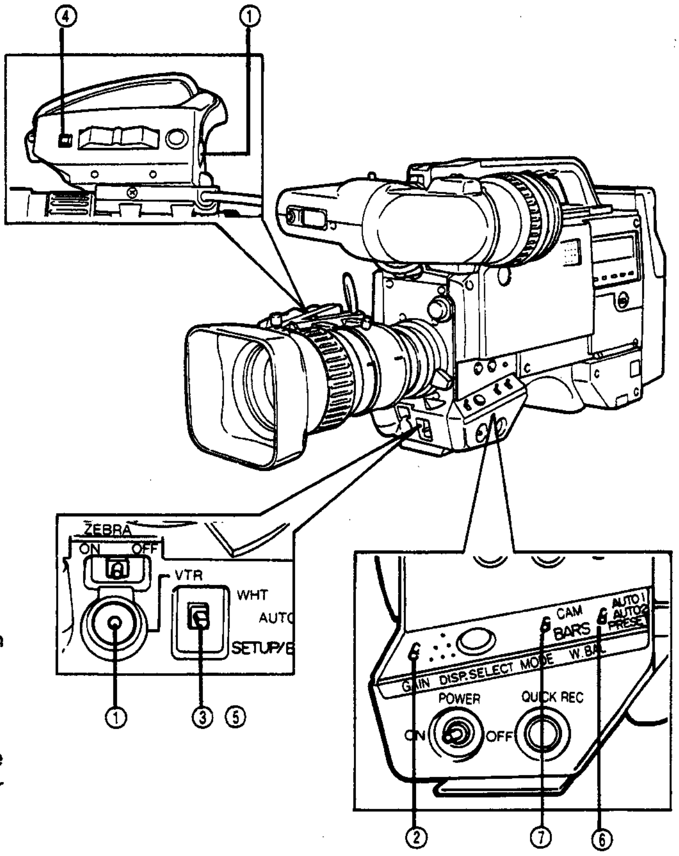
- Counting stops when the power is switched off. Therefore, when using the FREE RUN mode to record real-time data, the coincidence between the recorded and real-time data will be lost if the power is switched off.
- Missing time data may occur at the end and/or start of recording of different takes in the REC RUN mode. Pay attention to this when using time codes.

REMOTE CONTROL USING THE RM-LP80 (GY-X1TC only)

This unit can be remote-controlled using the optional RM-LP80 Local Remote Control Unit. The controls on the RM-LP80 correspond to the numbered controls of the GY-X1TC as shown below.



RM-LP80
Connect to the camera's RM connector using the cable provided with the RM-LP80.
JVC
RM-LP80
LOCAL REMOTE CONTROL UNIT
OPERATE ON OFF
BARS ON OFF
VTR
ON for remote operation.*
①
⑦
TEST OUT SELECT
ENC
R-G
B-G
AUX
HI-SENS +18dB +9dB 0dB
No corresponding control on the camera.
②
WHITE BAL
AUTO
AUTO WHITE
MEMO
MANU
AUTO BLACK
AUTO SET
AUTO SHIFT
⑥
⑤
③
White balance control knobs, effective when switch ⑥ is set to MANU.
WHITE PAINT
B
R
IRIS
AUTO
MANU
④
MASTER BLACK
IRIS
Black level control knob.
CLOSE
OPEN
Iris control knob, effective when switch ④ is set to MANU.



④
①
ZEBRA
ON
OFF
VTR
WHT
AUTO
SETUP/B
①
③ ⑤
CAM
BARS
AUTO1
AUTO
PRESET
GAIN
DISP.SELECT
MODE
W.BAL
POWER
ON
OFF
QUICK REC
②
⑦
⑥

* In the "ON" position, switches on the camera corresponding to those on the remote control except ① are not operable. Also, viewfinder indications for settings of these switches are not available.

Corresponding switch positions

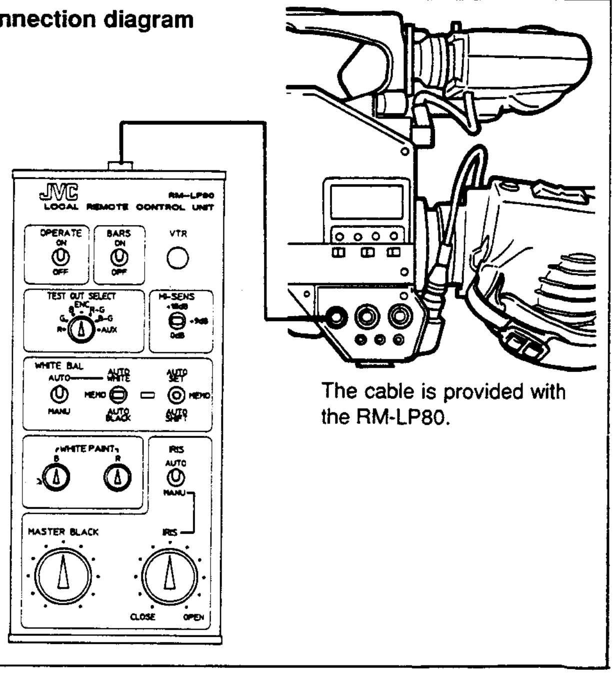
RM-LP80	GY-X1TC	Remarks
OdB 9 dB 18 dB	● ●● ●●●	0 dB, 9 dB, and 18 dB, regardless of the setting by the memory function.
AUTO SET AUTO SHIFT	SETUP/BLK None	Auto setup operation*
AUTO WHITE AUTO BLACK	WHT SETUP/BLK	Auto black operation
AUTO MANU	AUTO1 PRESET	
ON OFF	BARS CAM	

* Auto setup operation: Automatic adjustment of black balance, white balance and black balance in that sequence.

Notes

- Quick-recording start/stop cannot be remote-controlled.
- Refer to the instruction manual of the RM-LP80 for other information.

Connection diagram



JVC
RM-LP80
LOCAL REMOTE CONTROL UNIT
OPERATE ON OFF
BARS ON OFF
VTR
TEST OUT SELECT
HI-SENS
WHITE BAL
AUTO
AUTO WHITE
MEMO
MANU
AUTO BLACK
AUTO SET
AUTO SHIFT
WHITE PAINT
B
R
IRIS
AUTO
MANU
MASTER BLACK
IRIS
CLOSE
OPEN

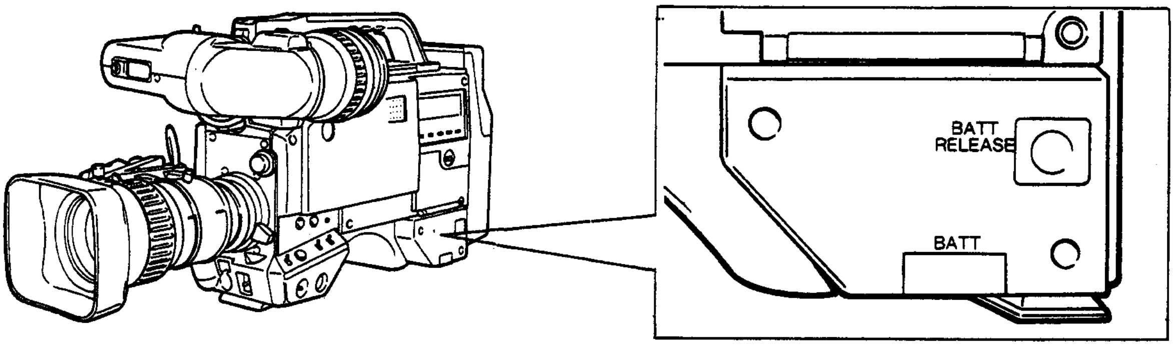
The cable is provided with the RM-LP80.

REPLACING THE CLOCK BACKUP BATTERY

The clock backup battery is used to retain the built-in clock and hour meter data even while the power is off.

When the clock backup battery is exhausted, the time and hour meter data are lost when the power is switched off, and are initialized when the power is switched on again. To avoid this, it is recommended that you replace the battery once a year.

Replacing procedure
Be sure to replace the battery while the power is on, otherwise the data will be lost.



1. Pull out the clock battery compartment cover. The battery will come out with the cover.
2. Install a battery with the correct polarity. The "+" terminal should be up.

Usable batteries
JVC's CR-2025
or a lithium battery for a clock (DC 3 V), equivalent to the CR-2025.

SPECIFICATIONS

• CAMERA SECTION

Image pickup device	: 1/2-inch interline CCDs
Colour separation optical system	: 3-colour separation prism
Number of effective pixels	: 390,000 pixels
Colour system	: PAL (R-Y, B-Y encoder)
Sync system	: Internal sync/External sync (GY-X1TC only)
Lens mount	: Bayonet system (compatible with lenses for 1/2" CCD cameras)
Optical filter	: 3200K, 5600K, 5600K + ND
Sensitivity	: F1.4, 20 lux (+ 18 dB)
Gain	: 0, +6, +9, +12, +18 dB ALC (Selectable in advance memory system)
S/N ratio	: 56 dB (typical)
Horizontal resolution	: 600 lines (luminance signal)
Registration	: 0.05% or less (excluding lens distortion)
Contour correction:	Horizontal dual-edged, vertical dual-edged
Shutter speeds	: 1/120, 1/250, 1/500, 1/1000

• VTR SECTION

Format	: S-VHS standard
Tape speed	: 23.39 mm/sec.
Record/playback time	: 30 min. (with SE-C30 cassette)
Fast forward/rewinding time	: 4 min or less
Cassette tape	: SVHSC
Number of audio tracks	: 3 (HiFi: 2, normal: 1)
Horizontal resolution	: Colour 400 lines (in S-VHS mode)
Video S/N ratio	: S-VHS ... 44 dB VHS ...42 dB
Audio S/N ratio	: 40 dB or more (NORMAL) 50 dB (HiFi)
Time code	: VITC 13H, 15H Drop frame

• INPUT/OUTPUT SIGNALS

Video signal output	: 1 V BNC
Audio signal output	: –6 dB (low impedance, unbalanced), XLR, RL
Lens	: 12-pin connector
Y/C signal	: 7-pin connector
DC input	: 12 V, XLR 4-pin connector
Genlock input	: 1 V, BNC
Camera output	: 1 V, BNC
Remote connector	: For connection of optional RM-LP80
External microphone input	: XLR 3-pin × 2 or 6-pin connector, 600Ω Balanced

• GENERAL

Power consumption	: 25 W or less (including the lens and viewfinder)
Weight	: apx. 12 lbs (5.5 kg) (including lens, viewfinder)
Operating temperature range	: 0°C — 40°C

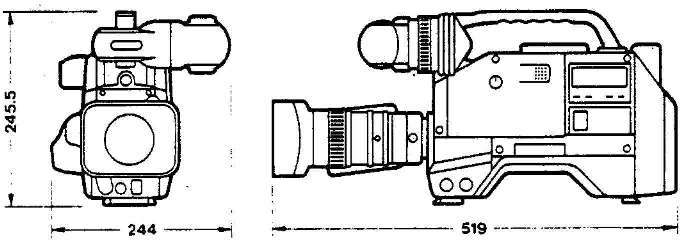
• 14X ZOOM LENS HZ-714

Focal length	: 7 to 98 mm
Max. aperture ratio	: 1:1.4 (f=7 to 81 mm) –1.7
Zoom ratio	: 14:1
Minimum object distance	: 1 m (3 feet)
Macro distance	: 30 mm
Mount	: 1/2-inch bayonet (FB 35.74 mm in air)
Front thread diameter	: 72 mm, P=0.75
Iris operation	: Motor drive/manual
Zoom operation	: DC servo drive/manual
Focusing	: Manual (mechanical internal focus)

• 1.5-inch VIEWFINDER VF-P115

CRT	: 1.5 inch
Resolution	: 500 lines or more
Input signal	: Composite 1 Vp-p, high impedance
Available functions	: Top tally lamp (with ON/OFF switch) Low battery indicator (RED) Recording indicator/tape travel alarm (GREEN) Contrast control Brightness control
Diopter control	: provided
Power requirements	: 12 V DC, 3 W

• Dimensions (unit: mm)



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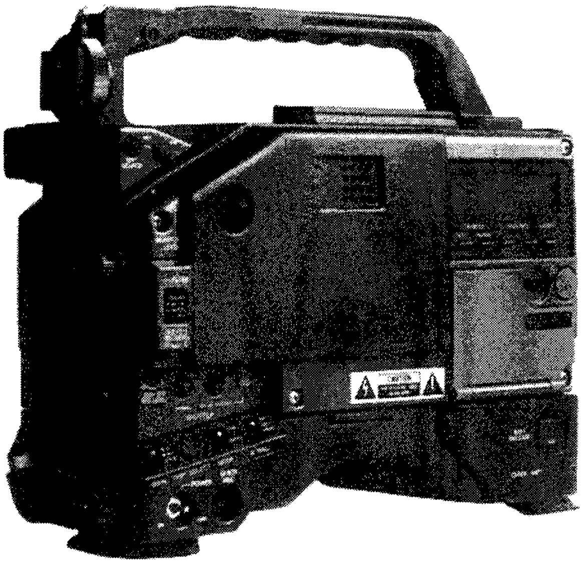
Printed in Japan
SC96512

GY-X1TCE/GY-X1E

CAMERA HEAD SECTION



SECTION 1
CIRCUIT DESCRIPTION

1.1 COLOR SEPARATION PRISM

The color separation prism of this model is of the R-G-B separation system and the structure is the same as that of the 3-tube prism. However, the spectral characteristic of this prism is slightly different from that of the 3-tube prism since the CCD has high sensitivity to long waves (red), and the prism has an infrared radiation absorbing filter on the whole surface to correct the high sensitivity to the infrared radiation.

The most important optical factor of the CCD camera is, of course, the chromatic aberration, however, this type of camera cannot electrically correct image magnification (difference in R, G, B images resulting from wave lengths) since it has no deflecting circuit. Therefore, it is the first condition to reduce chromatic aberration of the lens and the prism of this type of video camera as little as possible. Accordingly, almost all of lenses for B/W ITV cameras can not be used since they reproduce images being out of focus as well as they cause misregistration.

For the GY-X1, make sure to use the specified lens (for F5, 1/2" format, bayonet mount type – KY-17 series in concrete).

The standard lens for the GY-X1 is the HZ-714 lens. HZ-713 and HZ-H713 lenses are suitable for the GY-X1 optically, but the lens connector of them (8 pins) must be changed to a 12-pin connector.

If a lens of the series "4" such as HZ-410 or HZ-416 is used with the GY-X1, it causes misregistration and out of focus.

The CCD is precisely installed in the correlatively correct position with the prism. If there occurs misregistration or difference in R, G, B focusing owing to the characteristic of the lens used, there is no method to correct it.

The GY-X1 employs the spatial offset system.

1.2 CCD

The CCD employed in the GY-X1 is μPD3555 made by NEC for the 1/2" image size. The number of its effective pixels is 683 x 582 with horizontal resolution for each channel is about 500 TV lines.

As same as μPD3556 made by NEC, which is employed in the KY-17/-15, it is an interline transfer CCD with changeable shutter speed (exposure time) besides big improvements in smear and ghost. Smear which occurs by rays of light incident upon signal lines and the CCD is sharply reduced in the CCD of the GY-X1 by the measures that V-CCDs of μPD3555 are arranged as though they are enclosed by the photo shield in order to prevent them from rays of light to be incident through openings of the shield.

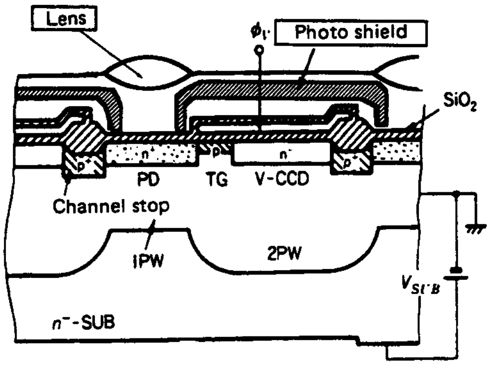


Fig. 1-1 Cross section of CCD

As the area of the photo shield increases, the open area ratio of each pixel decreases and the sensitivity is also reduced. In order to solve this problem a lens is attached to each pixel, therefore, the sensitivity is improved for about two degrees of stops. This results in increase in the condensing rate as well as in improvement in smear occurrence.

In addition, the material of the photo shield covering parts other than pixels is changed from glass to aluminum. Conventionally, light is shielded by coated glass which has much diffused reflection inside it and causes ghost. Aluminum, although it replaces conventional coated glass, it is not suitable for perfect coating and reflects all rays of light. As a result flare is generated by the reflection. However, it is improved by multi-coating and ghost is reduced at the same time.

Besides alteration of the material, processing method of the electronic shutter is also improved as described in the following.

In μPD3556 (employed in the KY-17/-15), excess charge is drained by high-speed reverse transfer in the V-CCDs. In μPD3555 (employed in the GY-X1), excess charge is drained toward the depths of elements by multiplexing pulses onto V-SUB voltage. As a result, the memory which is necessary for μPD3556 is useless in μPD3555 and shutter speed can be changed optionally. In the GY-X1, one of five kinds of shutter speeds can be selected, namely, 1/50 sec (standard), 1/120, 1/250, 1/500 and 1/1000.

Other alterations are as follows.
Pins which have not been utilized are omitted from the IC, and the number of pins becomes 16 (formerly 20 pins).
H2L pulse is newly used for transfer of H-CCD charge to the FDA amp (transmission amp of CCD).
–8 V power supply is not needed.

The above alterations and improvements are summarized in Table 1-1.

	μPD3556 (KY-17/15)	μPD3555 (GY-X1)	Altered points
Arrangement of photo shield	Simple structure Big opening ratio (High sensitivity)	Complex structure Small opening ratio but sensitivity is improved by attaching a lens to each pixel.	Sharp reduction in Smear
Kind of shield material	Coated glass that produces ghost by its diffused reflection	Multi-coated aluminum for perfect shielding and for reducing flate	Reduction in ghost
No. of pins	20	16	
Shutter	Memory is needed to utilize V-CCD.	Shutter speed is changeable by varying V-SUB voltage.	Memory unnecessary Changeable shutter speed

Table 1-1 Altered points of new CCD (μPD3555)

Note:

- When one of three CCDs becomes defective, it cannot be replaced unless the correlative position is correctly adjusted.
- Since the optical block assembly is composed of the prism and three CCDs which are precisely attached to the prism, it needs factory repair or replacement as the assembly when any component is faulty.

1.3 IMAGE SENSOR BLOCK

The image sensor block comprises the CCDs, IS board, DR1 board and DR2 board. Since the CCDs are closely attached to the prism for the space pixel shift, horizontal resolution on Y-channel is 600 TV lines.
For the space pixel shift, it is required to coincide signals of respective channels with each other in timing by the circuit. In the KY-17/-25, charges are read out of three CCDs with a pulse, therefore, the delay line is used to time signals of respective channels. Although the circuitry for this system is simple, it raises the production cost owing to use of the delay line with a weak point not to perform fine adjustment of delay time. In addition, it has another problem that phase difference among R, G, B signals occurs in their low frequencies having influence on registration when their phases are adjusted with high frequencies which have effect on the resolution.
In the GY-X1, after charges are read out of the CCDs by a pulse, G-channel signal is again sampled by a 1/2 delayed pulse (resampling system). The circuitry for the resampling system is comparatively complex, but it makes fine adjustment of signals in timing possible without such problem as phase difference among different bands.

1.3.1 ISR, ISG, ISB boards

The ISR, ISG and ISB boards are equipped with CCDs respectively besides they have sample holding circuits for R, G, B channels. The circuitry for each channel is mostly the same as that of the others except the resampling circuit for G channel.
IC1 is the CCD. Pulses (V1, V2, V3, V4, H1, H2, H2L) necessary for reading charges out of the CCD are supplied from the DR2 board.
Respective pin functions of IC1 are as follows.

Pin No.	Symbol	Function
1	φR	Reset (neutralizing) pulse input for FDA amp. (See Note).
2	VRD	Reset drain voltage input (power for reset gate
3	AG	GND of FDA amp.
4	Vout	Charge (video signal) output
5	VDD	Power voltage input
6	φH1	Horizontal drive pulse input 1
7	φH2	Horizontal drive pulse input 2
8	φH2L	H. final gate pulse input (transfer pulse to FDA amp)
9	ID	TEST signal output
10	φV1	Vertical drive pulse input
11	φV2	Vertical drive pulse input
12	φV3	Vertical drive pulse input
13	φV4	Vertical drive pulse input
14	PS	Voltage input for photo shield
15	G	GND
16	SUB	Power voltage input for V-SUB signal

Note: FDA (Floating Diffusion Amp) is a transmitter amp. of CCD.

ϕR1 functions to neutralize excess charges remaining in the charge detection gate installed inside IC1. This input is supplied synchronizing with ϕH1 just after video signal output. Therefore, signal (V. OUT) outputted from the CCD image sensor is not continuous signal but intermittent one as shown in Fig. 1-2. This intermittent signal is converted into continuous signal by sample holding of the signal potential ② (see the figure) referring to the potential ① of V. OUT as the base level.

IC2 is the sample holding IC. Output signal (V. OUT) of IC1 (CCD) is supplied to IC2 via Q1 of a buffer. The signal inputted to IC2 is clamped to reduce noise components generated by the FDA amp. of the CCD. The clamping signal is composed of the fall timing of ϕR which is multiplexed to video signal and the fall timing of SHP (sample holding pulse), which functions for sample holding of signal voltages. (See "CP" in Fig. 1-2.)

This SHP is produced by the DR2 board.

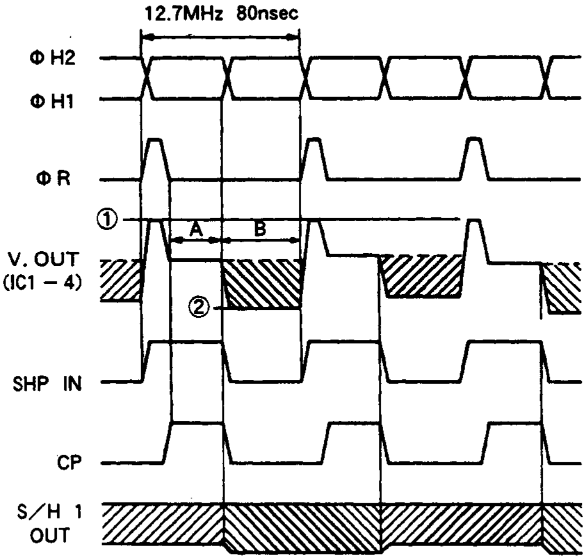


Fig. 1-2 Correlative double sampling

Regarding to noise components whose frequencies are lower than the period of V. OUT (80 nsec = 12.9 MHz), it can be said that there is a correlation between noises of the period A and the period B. Therefore, strongly correlating noise can be removed by sample holding of the signal potential ② referring to the potential of the period A as the base level. Such the sampling method is called the correlative double sampling.

Output signal of IC2 is supplied to the process circuit of the PR1/PR2 board except that of G channel. Namely, output signal of G channel is half delayed by the sample holding circuit composed of Q2 and C12 to correct wrong timing resulting from the space pixes shift system before it is supplied to the process circuit.

1.3.2 DR2 board

The DR2 board includes the CCD drive pulse generator circuit.

Each IC functions as:

IC1 : H. drive pulse generator and driver,
IC2 : SSG and V. drive pulse generator,
IC3, 4, 5 : V. driver for B, G, R channel, respectively.

1. Genlock

Pulse to drive the CCD must be synchronized with internal SSG of the camera.

IC1 outputs clock pulse synchronizing with the oscillation frequency of X1 (crystal oscillator) through pin 11.

Inside IC2, this clock pulse is counted down to H. period and is compared with HD pulse inputted through pin 73. The comparison result is outputted as the error voltage from pin 75 to X1 and it controls the oscillation frequency. The CCD H. drive pulse can be synchronized with the H. sync. signal of the internal SSG since the HD pulse is supplied from the internal SSG.

On the other hand, V. sync signal generated by the internal SSG is inputted through pin 5 of CN7 and supplied to pin 72 (V. reset) of IC2 via the inverter inside IC1. Accordingly V. drive pulse generated by IC2 can be synchronized with V. sync. signal of the internal SSG.

2. H. drive pulse

H. drive pulse is outputted from pins 23 (H1C) through 25 (H1A) and pins 31 (H2C) through 33 (H2A) of IC1, and supplied to the ISB, ISG, ISR boards to drive horizontal transfer of the CCD.

H2L outputted from pin 21 of IC1 is a pulse to transfer charges from the H-CCD to the FDA amp.

3. V. drive pulse

From the clock pulse inputted to pin 78 of IC2, V. drive pulse and TG pulse are produced. V. drive pulse is outputted from pin 15 (V1) through pin 18 (V4) of IC2 while TG pulse is outputted from pin 14 of IC2. They are supplied to the driver ICs (IC3, 4, 5), and TG pulse is multiplexed to V1 and V3 pulses to yield three kinds of pulses different in the level. These three levels are set by VH, VM and VL voltages supplied from the DR1 board.

Outputs of the driver ICs are supplied to ISB, ISG and ISR boards respectively to drive vertical transfer of the CCD.

4. Sampling pulse

Pulse outputted pin 15 of IC1 is once fine adjusted by the pulse timing in the DR1 board, and then inputted to pin 7 of IC1 again. According to this pulse timing, the sampling pulse is produced and outputted from pin 12. Henceforth, this output signal branches into two lines; one is supplied to respective sample holding ICs of the ISB, ISG and ISR boards, while the other flows to the DR1 board again to be supplied to the resampling pulse generator circuit for G channel. (Refer to Section 1.3.3.)

5. V. SUB pulse

V. SUB pulse is utilized for processing charges stored in the photo diodes inside the CCD in the electronic shutter mode. This pulse is outputted from pin 19 of IC2 only in the electronic shutter mode and supplied to IC2 to IC4 of the DR1 board. (Refer to Section 1.3.3.) The pulse period is different by the selected shutter speed.

The control logics (SHS1, SHS2, SHSP) of the shutter speed are transmitted from the CP board to pins 2 through 4 of IC2 via the DR1 board. (See Table 1-2.)

SHS1	SHS2	SHSP	
		L	H*
L	L	1/50	1/50
L	H	1/120	1/500
H	L	1/250	1/2000
H	H	1/1000	1/4000

* Unavailable in GY-X1.

Table 1-2 Shutter speed control logic

1.3.3 DR1 board

The DR1 board includes the V. drive pulse bias circuit, the shutter pulse generator circuit, etc.

1. V. drive pulse bias circuit

As mentioned previously in Section 1.3.2, bias voltages (VH, VM, VL) of V. drive pulse are set by Q4, Q5 and Q6. VH is the same as the voltage set by VR4 since pin 8 or 9 of AN8 has high potential and the anode of D13 is accordingly open in the electronic shutter mode.

2. Shutter pulse generator circuit

IC2, 3 and 4 are level shifters for B, G and R channels respectively. The following explains about IC2 by way of example.

HD pulse (generated by IC2 of the DR2 board) inputted to pin 2 of IC2 functions to switch on/off DC 15 V to be supplied to pin 8. L2 and C17 make this DC 15 V resonate to yield a high level pulse, which is then integrated by C17 and R19 and rectified to DC 39 V by D5.

Utilizing this voltage, V. SUB pulse supplied from IC2 of the DR2 is converted to 39 Vp-p pulse to output from pin 6. Its DC component is once cut out, but again the pulse has DC voltage determined by VR1 (VR2 or VR3), however, the peak level is limited to DC 39 V by D6.

3. Re-sampling pulse generator circuit

Sampling pulse generated by the DR2 board is half delayed by the delay line DL1 to obtain resampling pulse for G channel. DL1 is a delay line with waveform shaping function and its delay timing is 20 nsec. The delay time of the output is fine adjusted by an integrating circuit composed of VR5 and C31. Moreover, another delayed pulse processed by an integrating circuit composed of R25 and C32 and its bypassed pulse are supplied to the AND gate to set the delay time to 20 nsec correctly. This process is for avoiding sampling of undesired components.

1.4 PR1, PR2 BOARDS

The PR1 and PR2 boards include the following circuits respectively.

Black clamping circuit, Shading correction circuit, High sens. circuit, Dynamic shading circuit, Gain control circuit, Newly developed processing IC.

The circuit configuration is the same for R, G and B channels. The following explains about G channel by way of example.

1.4.1 Black clamping circuit (PR1 board)

Video signal supplied from the IS board contains much high frequency noise components mixed in readout from the CCD. To eliminate such noise components, DL2 of a delay line is used as an LPF of 8 MHz/−3 dB.

Video signal whose noise components are cut out by the LPF is supplied to the black clamping circuit, which sets the black level of the signal to 3.2 V by the base of Q20 and clamp pulse (CP). After the gain of the signal is adjusted by Q21 and VR2, Q22 samples the voltage of the black component with burst clamp pulse (BCP). By comparing the sampled voltage with the reference 3.2 V by IC5-A, the clamping voltage of Q20 is adjusted to stabilize the black component. This process makes preset black adjustment for conventional video cameras unnecessary.

Black balance between channels is taken by clamping the optical black (OB) components with BCP before it the signal flows into the black clamping circuit. This clamping voltage is that adjusted by VR5 of the black balance volume. For auto black adjustment, control voltage is added to this clamping potential from the CPU via IC23.

Output of the black clamping circuit is supplied to the high sens. circuit of the PR2 board after its blanking period is accurately adjusted.

1.4.2 High sens. circuit (PR2 board)

Q15 (CXD7500) is a variable resistance element. When there is a difference between potentials of pin 6 and pin 7 of this element, resistance between pins 2 and 3 varies according to difference grade of the potentials. The high sens. circuit of conventional cameras gradually varies resistance step by step, however, this element realizes contінous varying of gain.

Gain adjustment voltage from the CP board is supplied to this element via the data converter circuit (described later) and IC5, Q25 and Q24 to vary gain of Q16 of a base grounded amp.

1.4.3 Dynamic shading correction circuit (PR2 board)

Dynamic shading which appears as color phase irregularity in a picture is a phenomenon of unven quantity of light resulting from inconstant angle of incidence of luminous flux against the vertical direction of the optical color separation system.

IC2 (in case of G channel) is a double balanced differential amp, which functions as a dynamic shading correction circuit. Fig. 1-3 shows the equivalent circuit of IC2.

The input (pin 3) of IC2 is supplied with video signal that the upper part of an image is bright and the lower part is dark owing to dynamic shading regardless of the image having even intensity of light. In other words, such video signal has level variation in its vertical period. Therefore, the level of the video signal can be made even by inputting correction signal corresponding to the level variation. In concrete, the level is uniformed by varying gain of QC with a correction signal of V. period (sawtooth or parabolic wave) inputted to pin 8 of IC2.
Dynamic shading is not corrected for B channel since it is little in it, but corrected for G and R channels to equalize signal condition to that of B channel.

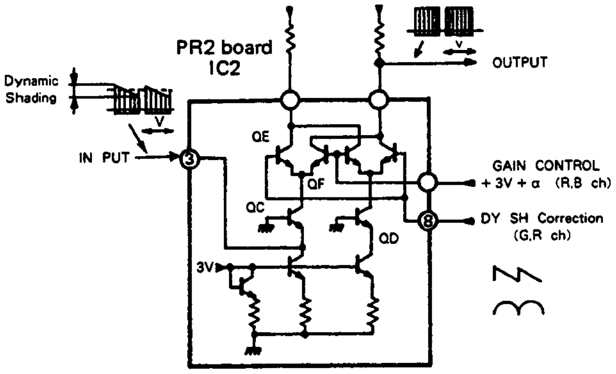


Fig. 1-3 Equivalent circuit of double balanced differential amplifier

For R and B channels, gain control for white balancing is operated inside IC2 as mentioned in the following.

1.4.4 Gain control circuit (PR2 board)

IC1 and IC3 are gain control circuits for white balancing of B and R channels. The internal double balanced differential amps are commonly used with the dynamic shading correction circuit.
White balance adjusting voltage supplied from the CP board is inputted to pin 10 of IC2 via the data conversion circuit in order to vary the gain of QC (see Fig. 1-3).
White balance adjusting voltage is ±150 mV as DC 3 V is the reference voltage.
Outputs of IC1, IC2 and IC3 are inputted to the PR1 board again, and further supplied to the NAM circuit and the newly developed processing IC.

1.4.5 NAM circuit (PR1 board)

R, G, B signals returned from the PR2 board are mixed in Q64 after they passed Q61, Q62 and Q63 respectively, and the mixed signal becomes NAM signal in IC9-A. This NAM signal is used in the auto iris circuit and auto knee circuit.

1.4.6 Newly developed processing IC (PR1 board)

Another output signal of the PR2 board is supplied to pin 32 of the newly developed processing IC (IC1, IC2, IC3). This IC include the following circuits.

Black level control circuit, Knee circuit, Flare correction circuit, Gamma correction circuit, Mixing circuit of contour correction signal, White clip circuit.

1. Black level control circuit
Pedestal level of video input signal to pin 32 is controlled by the control voltage inputted to pin 22.
In case of G channel, black level control voltage is supplied from the op. amp IC12-B. There are three kinds of control voltages inputted to this op. amp. They are as follows.

Master black control voltage common to every channel
This voltage is adjusted in the service mode of the CPU.
ABL control voltage
Reference voltage (2.5 V)

For B and R channels, voltage regulated by VR10 or VR12 is supplied for the reference voltage.
These VRs can be adjusted to regulate voltage to have the same level as black level of G channel.
ABL control voltage is supplied from the op. amp. IC11-A. (For ABL, refer to Section 1.4.7.)

2. Knee circuit
Signal whose black level is controlled is next processed by the knee referring to voltage supplied to pin 27 as the reference knee point. The voltage supplied to pin 27 of IC2 is the knee point – start point of non-linear section. When the potential (video signal amplitude + DC potential) of point A exceeds the potential of point B, emitter current of QA starts flowing. This reduces gain in the high level of video signal than that in the low level, and the signal is accordingly compressed.

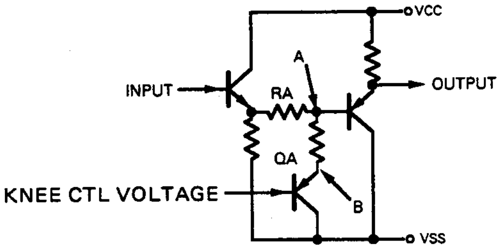


Fig. 1-4 Knee circuit

For G channel, knee control voltage is supplied from an op. amp of IC12-A, to which three kinds of control voltages are inputted as described below.

Master knee control voltage common to each channel
This voltage can be adjusted in the CPU service mode.
Auto knee control voltage
Reference voltage (2.5 V)

For B and R channels, voltage adjusted by VR9 or VR11 is supplied for the reference voltage. These VRs can be adjusted to regulate voltage to have the same level as that of knee slope.

The auto knee control voltage can be obtained by inputting output of the NAM circuit to the comparator (IC9-B), When the output voltage of the NAM circuit exceeds 300%, output of the comparator (output of IC9 pin 7) becomes low and this reduces the kkee point to 95% level.

The signal whose knee is adjusted is supplied to the flare correction circuit, ABL circuit, gamma correction circuit and mixing circuit, respectively.

3. Flare correction circuit

Flare is a phenomenon that black level of video signal is unstable owing to diffused reflection of incident light on the CCD surface and inside the lens.

Flare correction is operated by monitoring optical black (OB) of video signal and making the level constant.

OB component is sampled with the blanking pulse inputted to pin 28, and then integrated (averaged by external R145 and C95 (for G channel). This signal is again inputted to pin 23 to be supplied to the black level control circuit in order to stabilize OB.

Correction level is adjusted by the control voltage from the CPU for each channel.

4. Gamma correction circuit

Quantity of light incident to the CCD and output signal are proportional at a ratio of 1 to 1 ($\gamma = 1$), however, input signal of the CRT is not proportional to luminance as $\gamma = 2.2$ to 2.4. Therefore, output level of the camera against quantity of incident light is set so as $\gamma = 0.45$, which is called the gamma correction factor.

After the knee adjustment, output signal from pin 20 of the processing IC branches into two lines, but they are again inputted to pin 34 and pin 15 respectively. Signal inputted to pin 34 is processed by the gamma correction ($\gamma = 0.45$) and outputted from pin 39 to pin 16 in which it is mixed with input of pin 15 ($\gamma = 1$).

Voltage to determine mixing ratio is supplied from the CPU to pin 10 of the processing IC via the data conversion circuit. For R and B signals, respective mixing ratio is adjusted by VRs of the PR1 board to coincide with that of G channel.

The gamma correction method is different from that for conventional video cameras.

Conventional video cameras are equipped with the gamma correction circuit utilizing current-voltage characteristic of diode, this processing IC employs a gamme correction circuit of the polygonal line approximation system. As shown in Fig. 1-5, the polygonal line approximation system approximates the gamma of signal to the reference gamma characteristic curve by gradually varying output impedance according to the input signal level. Each base bias level of transistors QC, ED and QE is the varying point of polygonal line while each gain at turning on the transistor is the slant of the polygonal line.

5. Mixing circuit of contour correction signal

Gamma-processed signal is outputted from pin 8 of the processing IC. Signal of G channel is supplied to the SECC board to obtain contour correction signal, and again inputted to pin 6. On the other hand, signals of R and B channels are supplied to the delay line for contour correction and phase adjustment and inputted to pin 6, too.

The contour correction signal generated by the SECC board is inputted to pin 5 and mixed with those signals inside the IC.

Video signal, after it is mixed with the contour correction signal, flows through the black slice circuit and the white clip circuit inside the IC and is outputted from pin 45 of the processing IC.

Output of the processing IC is divided into two lines. In a route, the signal is supplied to the encoder of the SECC board while the other is supplied through the SECC board to the CP board to be used for the auto circuit.

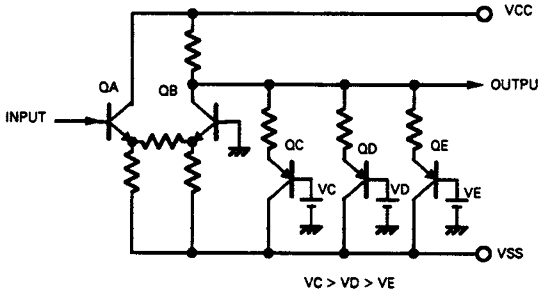


Fig. 1-5

1.4.7 ABL circuit

Since video signal is processed by the gamma correction circuit such as by black expansion and white compression, there is weak contrast in the highkey scene (high APL) in comparison with the lowkey scene. For compensating such flat images, R, G and B levels are automatically reduced in high APL picture in order to make it contrasty. This circuit is the ABL (Automatic Black Level) circuit.

R, G, G signals whose knees are processed in the processing IC are outputted from it and mixed with each other in Q66 to be Y (luminance) signal. The APL of this signal is detected by IC11-A and it is inputted to the processing IC again as the black level control voltage.

ABL correction amount can be varied in three steps, namely, APL is increased or decreased by turning on/off Q68, Q67 with a combination of ABL control data 1 and 2 supplied from the data conversion circuit.

1.4.8 Data conversion circuit

Since data signals from the CPU is transmitted in serial data, they are converted into parallel data by IC20 to IC22 and then converted into required voltages by the buffer of each line before they are supplied to further circuits.

Table 1-3 lists converted parallel data.

IC20 and IC21 output analog data while IC22 outputs binary data in H or L.

IC	Pin	Symbol	Data
IC20	15	A01	Contour level (to SECC board)
	2	A02	Auto black control voltage (B)
	3	A03	Auto black control voltage (G)
	4	A04	Auto black control voltage (R)
	5	A05	Gain adjusting voltage for (B) Hi-sens. circuit
	6	A06	" (G)
	7	A07	" (R)
	10	A08	Iris control voltage (To Lens via SECC, MT1, MT2)
IC21	15	A01	Auto white control voltage (B)
	2	A02	Auto white control voltage (R)
	3	A03	Master knee control voltage
	4	A04	Gamme correction mix level
	5	A05	Flare correction level (B)
	6	A06	Flare correction level (G)
	7	A07	Flare correction level (R)
	10	A08	Master black control voltage
IC22	7	Q4	ABL control data 1
	14	Q5	ABL control data 2
	13	Q6	Gamma correction ON/OFF
	11	Q8	Auto knee ON/OFF

Table 1-3 Parallel data

1.5 SECC BOARD

This board is composed of three sections of encoder, contour signal generator and SSG.

1.5.1 Encoder section

Video signal output from the PR1 board is inputted to pins 12 to 14 of CN19 of the SECC board and further supplied to analog switches IC32-A, -B and -C, which switch video signal and color bar signal, respectively.

The encoder of the GY-X1 employs the color difference system.

After Q55, 58 and 61 mix edge signal of character to respective channels, the signals become R, R-Y and B-Y signls by IC26 of a matrix IC. Each band of the color difference signal of R-Y and B-Y signals is limited to 0.5 MHz by the internal constant of IC26 and an LPF consisting of C156 and C158. The signal is delayed by this band limit, moreover it is delayed owing to a band pass filter which the signal passes after is becomes chroma signal by the balanced modulator. Subcarrier which is supplied to the modulator is not a continuous wave and it is stopped during the blanking period.

Henceforth, the chroma signal branches into two lines for the main line output (GY-X1TC only) and for the VTR. The chroma signal for the main line output is mixed with Y signal by Q81.

Other chroma signal for the VTR is supplied to the VTR as it is except in the TC version in which it is mixed with the AEQ reference signal by the base of Q95. The AEQ reference signal is supplied from the RF1 board.

Regarding Y signal, it is mixed with setup signal (NTSC system), sync. VITC (TC version) and character signal by Q63, and then delayed by the delay line DL6 (140 nsec) for phase adjustment with the chroma signal.

Y signal output of the delay line branches into four lines, such as for the main line output, video level indication (zebra indication), VTR and lens.

The output for the main line (TC version) is supplied via Q65 and Q69 to Q81, which mixes it with chroma signal and outputs through the output connector.

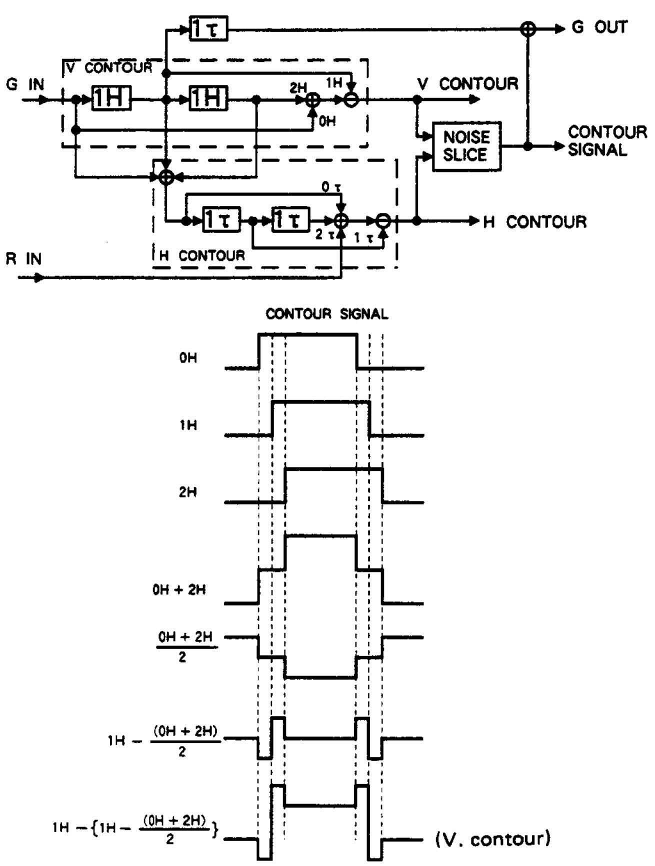
The output for the video level (zebra) indication is supplied via Q65 and Q69 to CBM2 to generate zebra signal. The zebra signal is mixed with EE-Y signal returned from the VTR together with character signals and outputted to the viewfinder.

Output for the VTR is supplied directly.

Output for the lens is supplied to the lens which requires video signal (auto focus lens) through the lens connector.

1.5.2 Contour signal generator

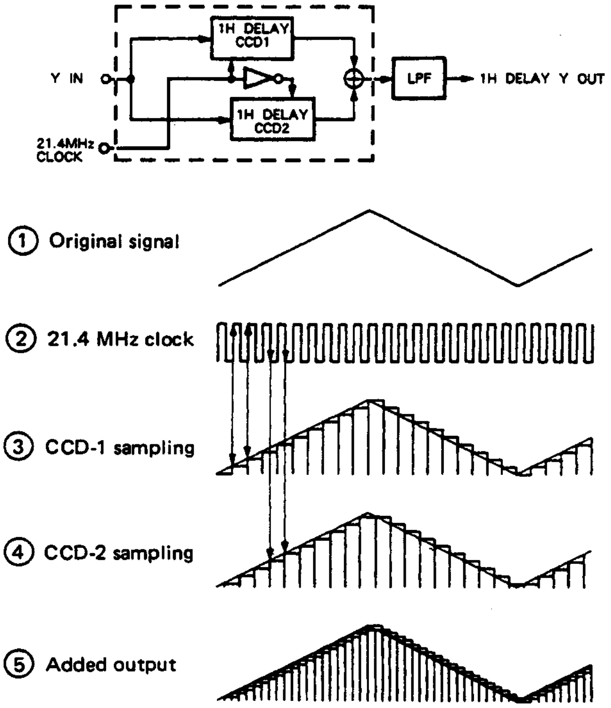
This generates contour signal to correct the contour of video signal electrically in both the vertical and horizontal directions (dual edging).
The contour (edge) signal is produced from video signals of G and R channels, and the video processing ICs for R, G, B channels provided on the PR board mix them.
Fig. 1-6 illustrates a block diagram of the contour signal generator circuit.



G IN
R IN
V CONTOUR
1H
1H
2H
1H
0H
1τ
G OUT
V CONTOUR
NOISE SLICE
CONTOUR SIGNAL
0τ
1τ
1τ
2τ
1τ
H CONTOUR
H CONTOUR
CONTOUR SIGNAL
0H
1H
2H
0H + 2H
(0H + 2H)/2
1H − (0H + 2H)/2
1H −{1H − (0H + 2H)/2}
(V. contour)

Fig. 1-6 Contour signal generator circuit

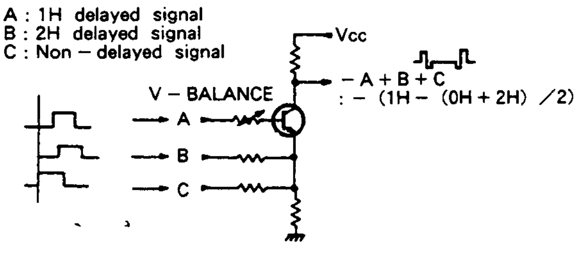
1. Vertical contour signal generator
G channel signal input from the PR1 board is delayed 1H by the delay line. For 1H delay, the glass delay line has conventionally been used, but the GY-X1 employs CCD delay lines.
IC1 is the CCD line which consists of two built-in CCDs in order to secure high band without raising clock frequency. To delay a 5 MHz signal at a rate of 1H by an ordinary CCD delay line, it generally requires 10 MHz clock. However, this CCD delay line secures 5 MHz band with 5 MHz clock. The flock frequency of the GY-X1 is 21.4 MHz.
Fig. 1-7 shows a block diagram of 1H delay CCD.



1H DELAY CCD1
1H DELAY CCD2
Y IN
21.4MHz CLOCK
LPF
1H DELAY Y OUT
① Original signal
② 21.4 MHz clock
③ CCD-1 sampling
④ CCD-2 sampling
⑤ Added output

Fig. 1-7 1H delay CCD

Inside the IC, each CCD is supplied with clock pulse whose phase is different from the other at an angle of 180°.
See Fig. 1-7.
The sampling result of CCD1 ③ and that of CCD2 ④ have phases different from the other at an angle of 180°, therefore, they mutually interpolate dropout portions by adding them (⑤). This clears that the added result is equivalent to sampling at a double frequency.
The 1H delayed signal is again delayed 1H by IC2, and 2H delayed signal is resultantly produced. 1H delayed signal, 2H delayed one and the original signal of G channel are supplied to the CBM1 and the vertical contour signal is produced by the mixing circuit shown in Fig. 1-8.
At the same time, the original signal of R channel is also mixed to them to produce another contour signal for red object. As a result, the border of red object is emphasized.



A : 1H delayed signal
B : 2H delayed signal
C : Non − delayed signal
Vcc
V − BALANCE
A
B
C
− A + B + C
: − (1H − (0H + 2H) ⁄2)

Fig. 1-8 Vertical contour signal generator

2. Horizontal contour signal generator

The horizontal contour signal generator circuit is installed in the CBM1.

The horizontal contour signal generator utilizes the 1H delay signal, 2H delay signal which are produced in the vertical contour signal generator circuit besides mixed signal of original signals of G and R channel. By mixing signals in the above manner, the resultant signal is equivalent to that passing through comb filters. As a result random noise contained in the contour signal is reduced and the S-N ratio is consequently improved by about 3 dB.

Mix signal (non-delay 0 τ) becomes the inverted signal (0 τ) by the collector of Q1 inside CBM1. This signal, moreover, becomes a delay signal ($-2\ \tau$) by folding it in the external DL5.

On the other hand, a signal having the same phase appearing at the emitter of Q1 inside CBM1 becomes a delay signal ($-1\ \tau$) after it passes Q3 and DL5.

The horizontal contour signal is produced from such the signals ($-0\ \tau$, $-1\ \tau$, $-2\ \tau$).

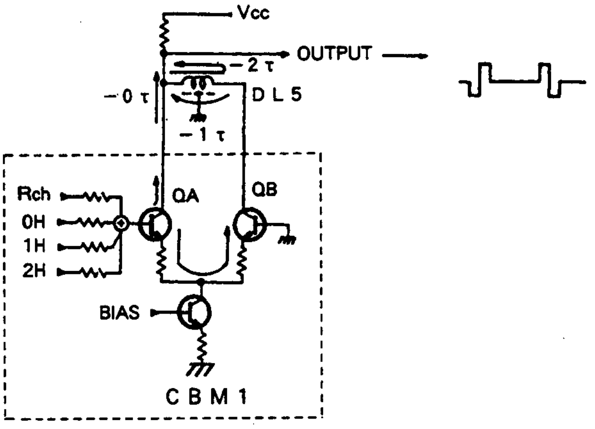


Fig. 1-9 Horizontal contour signal generator

3. Noise slice circuit

If contour correction is emphasized, it makes the picture very noisy, since the contour correction effects on noise components. Still, the contour signal itself contains such noise as shown in Fig. 1-10 in the center portion.

These noise signals can be sliced (cut out) by passing it through diodes having pseudo-directional potential corresponding to the amplitide of the noise.

D1 and D2 are employedD1 d to slice noise, and they are Schottky diodes whose junction volume is small because this considerably avoids noise in high frequency.

When the gain is raised by the high sens. circuit, Q17 is automatically turned on for stronger noise slice.

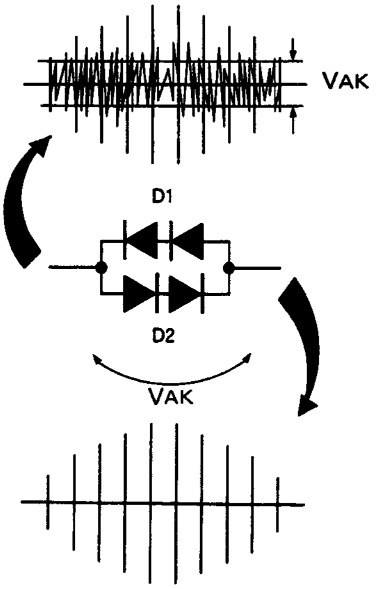


Fig. 1-10

1.5.3 SSG section

The SSG section is composed of newly developed two flat packaged C-MOS LSIs.

The 44-pin IC (IC6) functions as a subcarrier oscillator, while the 80-pin IC (IC7) generates other sync. signals besides color bar signal. Every pulse used for the camera is supplied from these ICs.

The SSG also functions as a gen-lock with external sync. signal.

1. Color bar signal generator

The color bar signal generator is built in IC7. Conventionally, R, G, B color bar signals are separated by counting down bar pulses, however, such the new IC directly outputs R, G, B color bar signals without adjustment of pulse amplitude. R, G, B color bar signals are supplied to the encoder section.

2. Sync. signal generator

4 fc clock pulse to be supplied to the SSG is generated by X1 of a crystal. When internal gen-locking is activated, this clock is counted down in IC6 to obtain a necessary SC. In addition, 4 fc clock is supplied from IC6 to IC7 which counts it down to generate sync. signals such as HD and VD etc.

1/4 fsc signal used to generate zebra signal is produced by quadruply dividing the SC in IC6.

HD and VD pulses are supplied to the DR2 board for gen-locking with CCD drive clock (27 MHz). (See Sect. 1.3.2.)

On the other hand, 27 MHz clock for external gen-locking is generated by X2. When external gen-locking is activated, the phase of these clock oscillators are controlled by external SC and external sync. pulses.

3. Synchronizing separator (TC version only)

Gen-lock operation is classified into three of color synchronization (SC signal), horizontal synchronization (H. sync.) and vertical synchronization (V. sync.). Signals necessary for respective gen-locking is separated from external sync. signal (VBS or BB) and supplied.

The band pass filter composed of Q29 and Q31 separates color component from external sync. signal, and separated color component is used for color gen-locking.
The circuit comprising Q2 through Q4 is a sync. separator, which separates C. sync. signal from external sync. signal. Separated C. sync. signal is inputted to pin 73 of IC7, and it is separated again into H. sync and V. sync. signals.
H. sync. signal is outputted from pin 72 to be used for horizontal gen-locking and for generating burst gate pulse to extract burst signal from separated color component.
V. sync. signal is outputted from pin 71 to be used for vertical gen-locking.

4. Color gen-locking (TC version only)
Color gen-locking is operated by comparing phases of color burst signal extracted from external sync. signal and of SC (subcarrier) generated in IC6 and feeding back the resultant error voltage to X1.
Color component separated by the synchronizing separator circuit is supplied to the TC board for phase adjustment, and then inputted to pin 11 of IC19 of the SECC board. On the other hand, SC (subcarrier) generated in IC6 is inputted to pins 6 and 8 of IC19.
At the same time, burst gate pulse is inputted to pin 9. This burst gate pulse is obtained by inputting the C. sync. signal to IC16 of a monomultivibrator.
IC19 is a phase comparator which extracts burst signal contained in external color signal timing with burst gate pulse to compare the phase with that of internal subcarrier. The result of the phase comparison is outputted from pin 1 as error voltage, which is amplified by IC18-B (op. amp.) and supplied to a variable capacitance diode D3 to control the oscillation frequency of X1.
The color gen-locking is carried out by the above manner.

5. Horizontal gen-locking (TC version only)
H. sync. signal separated from external sync. signal and HD pulse generated by IC7 are compared by the phase, and the resultant error voltage is fed back to X2 to perform horizontal gen-locking.
The phase comparison is operated by PLL (IC17). External H. sync. signal is inputted to pin 3 of IC17 while internal HD signal is inputted to pin 14 of IC17 after its phase is adjusted by IC15.
IC15 is a two-step monomultivibrator. At the rise point of negative pulse obtained by the first step monomultivibrator, the 2nd step monomultivibrator is triggered. The phase of the output pulse of the 2nd step monomultivibrator is set by adjusting the rising timing of the 1st step monomultivibrator with H. phase voltage supplied from the TC board.
The result of phase comparison by IC17 is outputted from pin 13 as the error voltage. After this output is amplified by IC18-A (op. amp.), it is supplied to a variable capacitance diode D4 to control the oscillation frequency of X2.
The horizontal gen-locking is operated in the above manner.

6. Vertical gen-locking (TC version only)
Vertical gen-locking is operated by inputting V. sync. signal separated from external sync. signal to pin 70 (R. reset) of IC7.

1.6 CP BOARD

The CP board functions to control camera sections, auto operations (auto iris, auto black and auto white) as well as to enter into correspondence with the memory card according to a command from the CPU.

1.6.1 Main hardwares and their functions

1. CPU
The CPU (IC1) is MB89T715PF made by Fujitsu. The program to control the CPU is written in the ROM (IC15), and the contents are unchangeable unless the ROM is replaced. The CPU drive clock is generated by X1 (7.3728 MHz), however, VD pulse is sometimes supplied from the SSG (SECC board) in order to too time the operation with video signal.
This CPU has a built-in 8-bit A/D converter which enables the CPU to input analog data of 0–5 V DC directly. Besides it, there are R, G, B signals, peak value of NAM, APL value, REC/PLAY audio signal, iris position signal, power voltage are also inputted to the CPU.

2. Memory
Besides the program ROM (IC15), there are the following memories.
IC14 of an S. RAM to memorize the camera's state temporarily.
IC28 of an EEP ROM which stores settings and balancing conditions of auto white and auto black and the condition of the memory system whenever the power is turned off.

3. Serial data transmission
The CP board performs serial data transmission to/from the VTR and external equipment.
Serial data transmission between the VTR and CPU is operated by IC30.
Data transmission hetween the remote control unit (RM-LP80) and the CPU is directly performed through buffers of Q1 and Q2.

4. I/O switch
IC10, IC11 and IC12 output signals to select peripheral equipment (including peripheral ICs). The selection signal is supplied to the ROM, S. RAM, character generator, data conversion ICs of relating boards, etc.

5. Reset IC
IC9 is the power detector. When the power is turned on and the power voltage goes down, it generates reset pulse in order to prevent the CPU from overdrive as e in combination with C29, R50 and D5.

6. Hour clock counter
IC23 is an hour clock counter with a built-in 120-bit S. RAM. X2 is a crystal oscillator. The integrating hour meter to record the operation hours of the VTR works based on the block of this IC.
During the power of the camera off, the counter works by the backup battery. Data of the integrating hour meter is

stored both in the RAM and EEP ROM, however, the data is erased when the battery is depleted, and the time is reset at the same time.

7. Area gate signal and character signal generator
IC24 and IC25 generate character signal.
IC24 is used as area gate pulse generator. Namely, pin 17 outputs gate pulse for auto white while pin 18 outputs gate pulse for auto iris.
IC25 outputs character signal to the viewfinder.
These ICs are supplied with HD and V. sync. signals to time with video signal.
Area gate signal for auto white passes the NOR gate (IC29-A). In the full time auto white mode, the potential of the gate output is always LL since the other gate has H potential at this time. Accordingly, area gate is set for the whole picture in the full time auto white mode.
Area gate signal for auto iris is supplied to the NAM detection circuit and to the NAND gate (IC5-A) at the same time. When iris area is displayed in the viewfinder, the NAND gate becomes H and outputs area gate signal to the viewfinder.

8. Audio and voice signal synthesizer
IC22 is used as a for voice synthesizer.
According to combination of logics supplied to pins 9, 10 and 11, pin 20 outputs voice signal in six kinds of tones. See Table 1-4.

Pin 9	Pin 10	Pin 11	Voice
L	L	L	VTR WARNING
H	L	L	END OF TAPE
L	H	L	LOW BATTERY
H	H	L	– in Japanese –
L	L	H	– in Japanese –
H	L	H	– in Japanese –

Table 1-4 Voice output

Audio signal is supplied through the amp. (IC27) to the speaker installed inside the side cover. In the course of this signal flow, it is mixed with EE/PB sound from the VTR section. EE/PB sound is also supplied from the VTR to the CPU to indicate sound level in the viewfinder.

1.6.2 Control of camera section

- Refer to Fig. 1-11 on the next page.

1. Condition detection of each unit of camera
Conditions of operation switches and buttons of every part of the camera is inputted to IC1 of the MT1 board and IC1 and IC2 of the MT2 board as 0 V or 5 V DC. Each of these ICs is an 8-bit shift register, and they are combined in the cascade connection to compose a 24-bit shift register. IC1 of the MT1 board processes the lower 8 bits while IC1 and IC2 of the MT2 board processe the upper 16 bits. Data inputted into this shift register are transmitted to the CP board timing with the clock of the CPU in the order from the lowest bit.
Data of the operation buttons of the memory function are directly inputted to the CPU by operation button. Data of the memory card is serially inputted to the CP board, and further inputted to the gate composed of IC5-B, -C and -D together with the 24-bit serial data. The gate selects data from the memory card or 24-bit serial data under the control of the CPU, and sends the selected data to pin 3 of of the CPU (IC1).

2. Camera cotrol signal output
Control signals of the camera are outputted as serial data from pin 4 of the CPU (IC1). The camera control signal is supplied not only to the relating boards but also to ICs of the CP board. Serial data transmitted to each board is converted into parallel data by the data conversion circuit of respective board before it is utilized.

1.6.3 Auto iris control

1. Auto iris control
The auto iris is the function to control the lens iris by the driving motor so that the iris (F) is automatically set appropriately for quantity of light which changes from hour to hour.
The PR1 board produces NAM signal (max. value of R, G, B). After its knee is adjusted by Q11 and Q12 and then the level is adjusted by IC32, the signal branches into two lines. In a route, the signal is sampled by area gate signal for the auto iris in Q16, and it is averaged by R85, C21 and C69 to be APL signal.
In the other route, the signal enters Q13 in which it is sampled by area gate signal for the auto iris, and then it flows to the peak detection circuit composed of D15, R111, C67, C68 and Q14 to be outputted as peak signal.
These APL and peak signals are supplied to the CPU in which the internal A/D converter converts the signals into data.
The CPU mixes the average value and the peak value of the data at a certain ratio to coincide it (iris control voltage) with the reference value set in the CPU. Moreover, the CPU monitors variation of NAM value by VD period, therefore, the iris control is performed every VD period.
When the zoom lens of HZ-714 is attached, a potentiometer feedback corresponding voltage to the iris setting. This prevents hunting which occurs in the forced auto mode.

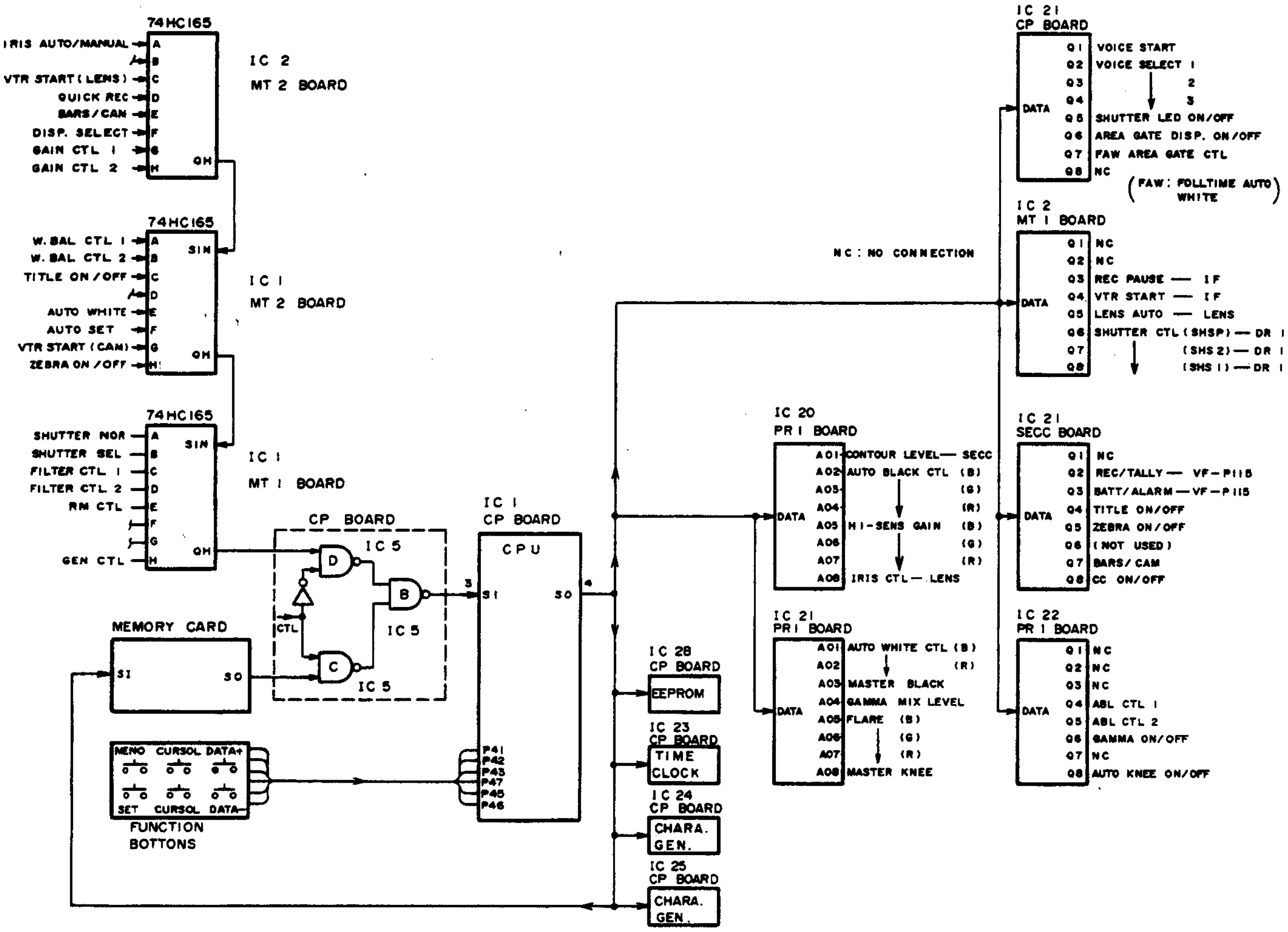

74HC165
IRIS AUTO/MANUAL
VTR START (LENS)
QUICK REC
BARS/CAM
DISP. SELECT
GAIN CTL 1
GAIN CTL 2
A
B
C
D
E
F
G
H
QH
IC 2
MT 2 BOARD
74HC165
W. BAL CTL 1
W. BAL CTL 2
TITLE ON/OFF
AUTO WHITE
AUTO SET
VTR START (CAM)
ZEBRA ON/OFF
SIN
QH
IC 1
MT 2 BOARD
74HC165
SHUTTER NOR
SHUTTER SEL
FILTER CTL 1
FILTER CTL 2
RM CTL
GEN CTL
SIN
QH
IC 1
MT 1 BOARD
CP BOARD
IC 5
D
B
C
CTL
IC 5
IC 5
MEMORY CARD
SI
SO
MENO
CURSOL
DATA+
SET
CURSOL
DATA-
FUNCTION
BOTTONS
IC 1
CP BOARD
CPU
3
SI
SO
4
P41
P42
P43
P47
P45
P46
IC 28
CP BOARD
EEPROM
IC 23
CP BOARD
TIME
CLOCK
IC 24
CP BOARD
CHARA.
GEN.
IC 25
CP BOARD
CHARA.
GEN.
NC : NO CONNECTION
IC 20
PR1 BOARD
DATA
A01 CONTOUR LEVEL — SECC
A02 AUTO BLACK CTL (B)
A03 (G)
A04 (R)
A05 HI-SENS GAIN (B)
A06 (G)
A07 (R)
A08 IRIS CTL — LENS
IC 21
PR1 BOARD
DATA
A01 AUTO WHITE CTL (B)
A02 (R)
A03 MASTER BLACK
A04 GAMMA MIX LEVEL
A05 FLARE (B)
A06 (G)
A07 (R)
A08 MASTER KNEE
IC 21
CP BOARD
DATA
Q1 VOICE START
Q2 VOICE SELECT 1
Q3 2
Q4 3
Q5 SHUTTER LED ON/OFF
Q6 AREA GATE DISP. ON/OFF
Q7 FAW AREA GATE CTL
Q8 NC
(FAW : FOLLTIME AUTO WHITE)
IC 2
MT 1 BOARD
DATA
Q1 NC
Q2 NC
Q3 REC PAUSE — IF
Q4 VTR START — IF
Q5 LENS AUTO — LENS
Q6 SHUTTER CTL (SHSP) — DR 1
Q7 (SHS 2) — DR 1
Q8 (SHS 1) — DR 1
IC 21
SECC BOARD
DATA
Q1 NC
Q2 REC/TALLY — VF-P115
Q3 BATT/ALARM — VF-P115
Q4 TITLE ON/OFF
Q5 ZEBRA ON/OFF
Q6 (NOT USED)
Q7 BARS/CAM
Q8 CC ON/OFF
IC 22
PR 1 BOARD
DATA
Q1 NC
Q2 NC
Q3 NC
Q4 ABL CTL 1
Q5 ABL CTL 2
Q6 GAMMA ON/OFF
Q7 NC
Q8 AUTO KNEE ON/OFF

Fig. 1-11 Block diagram of data input/output circuit

2. APB (auto peak/average balance)

The newly developed APB system is employed in the auto iris of the GY-X1. In conventional auto iris operation, peak value and average value of video signal are mixed at a certain ratio to control the lens iris. This system, however, brings such undesired result as surroundings of a subject whose average value is low like a spotlighted scene are darkened when the peak value has priority in the mixing ratio.

The APB system improves such the problem by automatic setting of mixing ratio between peak value and average value.

The mixing ratio is controlled by a software.

As a result, even when a spotlighted object is picked up, mixed ratio of peak signal becomes small and the iris is controlled not to darken the surroundings.

The APB system can be turned on/off by the memory function.

1.6.4 Auto white control

1. Auto white control circuit

The auto white control circuit corrects white balance by automatic adjustment of gains of R and B signals. R, G, B signals inputted to the CP board from the PR1 board are respectively supplied to CBM1, 2 and 3 (W/B DET CBM). Each input signal is sampled by area gate signal for auto white and converted into DC voltage of 0–5 V so that it can be supplied to the CPU. In the CPU the inputted R, G, B signals are converted into digital data by the built-in 8-bit A/D converter (256 steps in gradation).

For auto white control, gains of R and B signals are controlled so that data of R and B signals coincide with that of G signal which is the reference. When difference between the data of G signal (reference) and data of R and B signals is one step or less in gradation, the condition is held for 100 msec and then the operation finishes after completion of the white balance operation is confirmed. When a power driven zoom lens is attached, the CPU controls the lens to set the iris properly before starting automatic adjustment. Even when the lens iris is set to the manual mode, the iris is forcibly adjusted.

2. Full time auto white

In the full time auto white function, white balance automatically follows any change in color temperature of the lighting source in shooting. In the quick recording, the white balance is forcibly set to the full time auto white balance mode.

The full time auto white function of the GY-X1 utilizes the law "Color temperature changes nearly along the I axis."

In concrete, the whole picture is sampled and the white balance is controlled so that values of G-B and R-G are always "0". At that time, the control range is limited as shown in Fig. 1-12 in order to prevent erroneous operation against skin color.

Making full use of information about filters that is stored in the CPU, it changes control method and control speed according to the used filter.

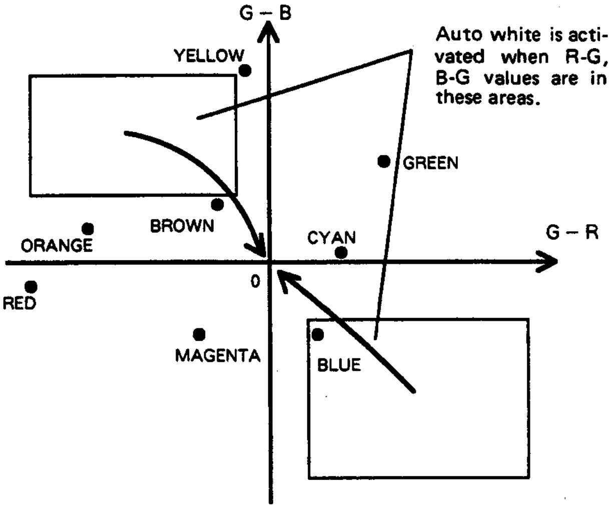

G – B
YELLOW
Auto white is activated when R-G, B-G values are in these areas.
GREEN
ORANGE
BROWN
CYAN
G – R
0
RED
MAGENTA
BLUE

Fig. 1-12 Outline of full time auto white operation

1.6.5 Auto black control circuit

The auto black control circuit corrects black balance by automatic adjustment of R, G, B signal gains with reduced quantity of incident light.

R, G, B signals supplied from the PR1 board are inputted to the CPU via CBM1, 2 and 3 respectively in the same manner as auto white control. The CPU sends AB CTL signal to CBM1, 2 and 3 to raise gain of the internal amp. of each CBM so that input black signal is amplified. Black components of inputted R, G, B signals are converted into 8-bit digital data in the CPU in the same manner as auto white. In concrete, the black clamping circuit of the PR1 board is controlled so that R, G, B signal data coincide with the reference value.

When a power driven zoom lens is attached, the lens iris is forcibly closed by the CPU prior to its automatic adjustment.

1.7 PS BOARD

The PS board generates five kinds of power voltages such as +5, +9, +18, −5 and −8 V DC from the 12 V DC supplied through the DC input connector, and supplies them to every board.

+9 and +5 V DC which are mainly used among the five voltages are generated by the switching regulator of the PS2 board. There are two circuits to generate switching pulse provided in IC1. Q1 and Q2 are driven by these switching pulses and they generate +9 V and +5 V DC respectively.

+18 V and negative voltage that need to boost are generated by the switching regulator of the PS1 board. Switching pulses are produced from 1/2 fh and HD pulses supplied from the SECC board. −5 V is obtained by inputting −8 V generated by the switching regulator to the series regulator IC2.

1.8 RF1/RF2 BOARD (TC version only)

The RF1 and RF2 boards generate the AEQ reference signal.

The AEQ (Auto Equalizer) circuit which automatically corrects frequency response of playback picture is employed in JVC professional S-VHS VTRs BR-S611 and BR-S811.

In recording, 3.81 MHz and 625 kHz reference signals are added to the vertical blanking portion of video signal, and the playback levels of the two signals are compared in playback. The comparison data is fed back to the AEQ circuit of the VTR in the edit play mode to correct the frequency response automatically

The reference signal is the AEQ reference signal which is added in recording.

The AEQ reference signal is obtained by sampling SC (subcarrier) supplied from the SECC board and 625 kHz signal produced by dividing the SC at optional timing.

Subcarrier is inputted to IC5 via the NAND gate (IC6-A) of the RF2 board besides it is supplied to IC7. The latter is divided into 1/6 to be 625 kHz signal, which is supplied to IC5.

Those signals inputted to IC5 are sampled by pulse generated by IC4 of the RF1 board, and the resultant signals become the reference signals.

IC4 of the RF1 board generates a pulse having 13.3 MHz clock which is the output of X1. This pulse is genlocked with SSG by C. sync. signal supplied to IC4. The phase of this pulse can be set to an optional 1H between 14H and 20H by combination of switches S1-2, -3 and -4.

At shipment from the factory, the phase is set to the 17th.

S1-1 of the RF1 is on/off switch of the AEQ. When it is off, Q6 of the RF1 board is turned off to stop power supply to the RF1 and RF2 boards. At the same time, it functions to close the NAND gate to shut off subcarrier.

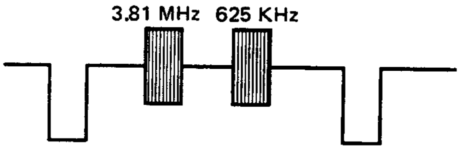


Fig. 1-13 AEQ reference signal

1.9 IF BOARD (VTR SECTION)

The IF board includes the audio circuit, camera-VTR interface circuit, video signal transmitter circuit, etc.

1.9.1 Audio circuit

Audio signal from the built-in microphone (reference output: –70 dB) flows through IC3 of a 30 dB amp. On the other hand, stereo audio signals from the external microphones are inputted to CN9 as audio L (H) and audio R (H) signals at a level of –60 dB. These signals are supplied to 20 dB amps respectively by L and R channels. IC2-A, B are used for R channel and IC1-A/IC3 are used for L channel. Switching between the audio L and microphone signals are performed by IC3. Control signal is supplied from the INT/EXT switch of the audio box via pin 10 of CN9.
Switching between stereo and monaural inputs are switched by IC10. As monaural signal is received, the audio L (or built-in microphone) is selected, while the audio R is selected for stereo signals. IC4 is an audio amp. whose gain is approx. 24 dB with ALC (auto level control) function.
SW1 switches recording of LTC (time code) signal into the normal audio track on or off. In LTC recording, microphone sound is recorded only on the Hi-Fi audio track.
Since the normal audio track is monaural, audio signals of L and R channels are mixed in the AUDIO board of the VTR section.
EE/PB audio signal from the VTR returns to pins 2 and 3 or pins 12 and 13 of CN3.
Signals of pins 2 and 3 are outputted from pins 7 and 9, and further supplied to the audio output L and R connectors via the MT1 board. Q3, Q4, C62, R155, and D1 compose a circuit to eliminate boing sound as the powr is turned on.
Regarding signals of pins 12 and 13, after L and R channel signals are mixed by IC13-A, the mixed signal is supplied to the CP board to be audio signal output from the monitor speaker and signal for audio level indication.

1.9.2 Camera-VTR interface circuit

IC6 converts parallel status signal supplied from the camera and VTR into serial signal, and it sends the signal to the S/S board of the VTR.
The VTR START signal inputted to pin 1 is a control signal supplied from the VTR trigger siwtch.
"N" inputted to pin 4 is switching signal for S-VHS or VHS and it is supplied from the LD board of the VTR.
MODE 0 and MODE 1 signals inputted to pins 5 and 15 are supplied from the CP board. They are usually L level but become H level in the self-diagonosis mode of the service mode.
Input signal to pin 6 is supplied from the window comparator of IC7. This output of the window comparator is H owing to DRUM REF signal supplied from the S/S board of the VTR as far as the drum motor is in normal operation.
Pin 7 is supplied with signal outputted by the window comparator composed of IC8. When the capstan motor is in normal operation, the output of the window comparator is H by CAP REF signal supplied from the S/S board of the VTR.
When those motors become faulty or have something abnormal, the VTR stops operation.

1.9.3 Video signal output circuit

Y/C signals inputted to the SECC board from the camera are directly transfered to the Y/C board of the VTR.
The circuit composed of Q8 is an external input circuit to measure the characteristic of the Y signal circuit of the VTR. Measurement is performed with external signal input through TP7, however, for this adjustment it is required to disconnect the connector CN35 to cut out Y signal from the camera and shortcircuit R124 which is usually open. After measurement, make sure to make R124 open and connect CN35 again.
EE/PB signal from the VTR is inputted to the IF board by Y, C and composite signals.
Y signal flows in two lines after Q20. In a route it is supplied to the SECC board and mixed with area gate and character signals to be viewfinder output signal.
In the other line, the signal is outputted from the Y/C OUTPUT connector (7-pin connector) via the amplifier composed of Q10 to Q14.
C signal is outputted from the Y/C OUTPUT connector (7-pin connector) via the amplifier composed of Q6, Q7 and Q9.
Composite signal is outputted from the VTR OUTPUT connector (BNC connector) via the amplifier composed of Q15 to Q19. This output is sufficient as EE output, however, it produces sag in video signal as well as dropout or irregularity in sync. signal caused by the characteristic of the VTR. In other words, the output is unsuitable for the main video output.

SECTION 2
DISASSEMBLY

2.1 FUSE REPLACEMENT

Before replacing a fuse, the reason why it blew should be investigated to prevent trouble from spreading. The malfunction should be repaired before replacing the fuse.

1. Before replacing a fuse, turn off the power switches of the camera and the AC adapter.
2. Remove the switch box located in the right front part referring to the section 2.3.1.
3. The fuse is located on the MT2 board.
4. For safety and protection of the unit, replace the fuse only with one having the specified part number.

Symbol No.	Rating	Part No.
F1	T3.15A, 250 V	QMF51A2-3R15

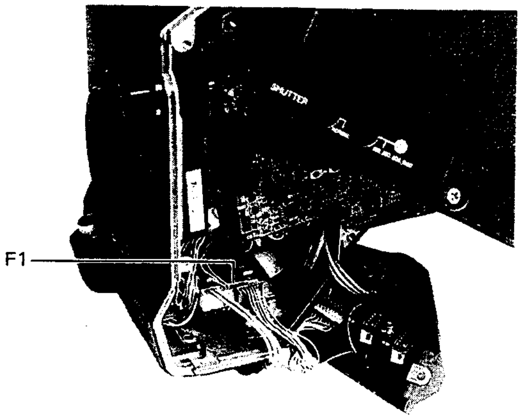


Fig. 2-1

2.2 REMOVAL OF COVERS

2.2.1 Right side cover

1. Loosen four screws ①-a/-b and open the right side cover.

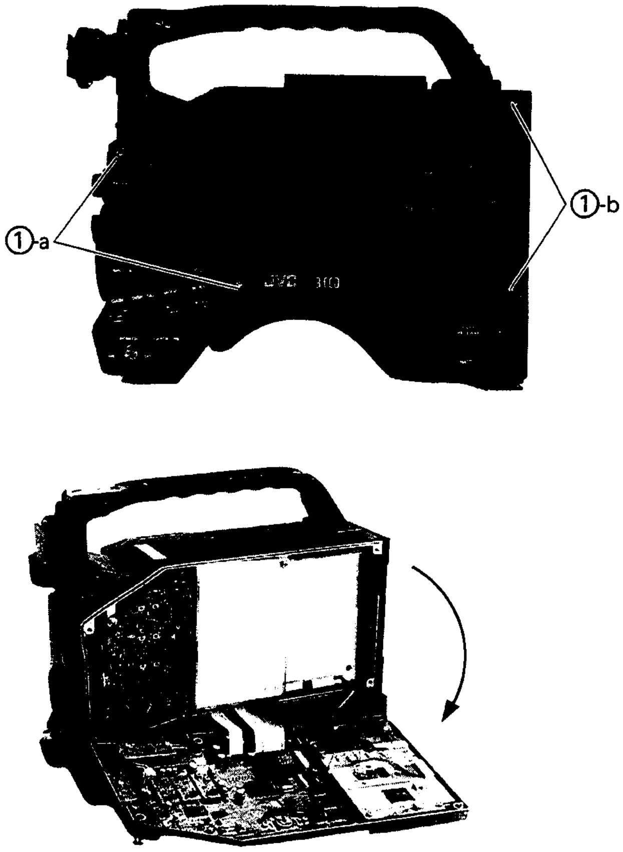


Fig. 2-2

2.2.2 Left side cover

1. Loosen two screws ② retaining the cassette cover.

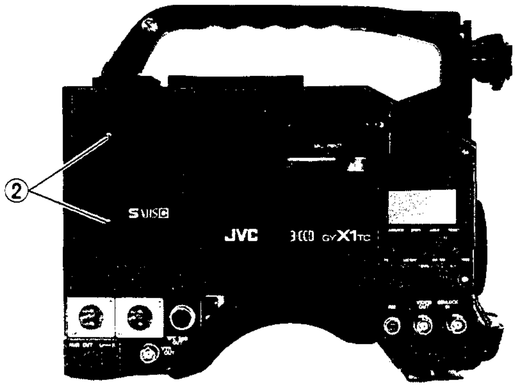


Fig. 2-3

2. Remove a screw ③-c which is fixing a tape damage protecting sheet.
3. Loosen four screws ③-a/b and take off the left side cover.

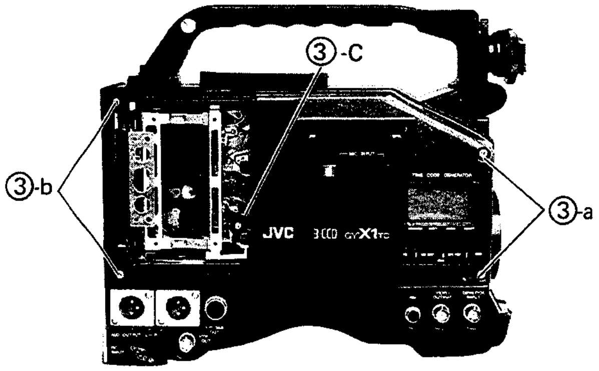


Fig. 2-4

2.2.3 Rear cover

1. Loosen four screws ①-b and ③-b shown in the Fig. 2-2 and Fig. 2-4.
2. Remove eight screws ④ to take off the rear cover.

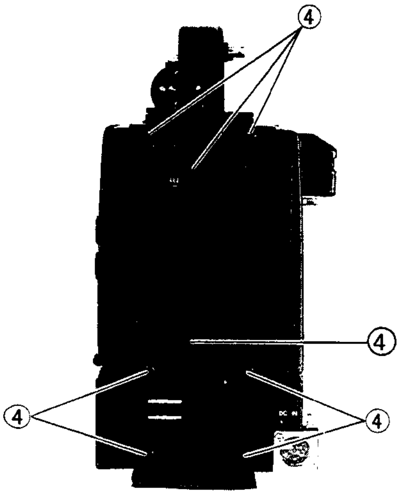


Fig. 2-5a

2.2.4 Top frame

1. Remove both side covers according to the section 2.2.1 and 2.2.2.
2. Remove the rear cover according to the section 2.2.3.
3. Remove the PR board and the SECC board according to the section 2.4.1 and 2.4.2.
4. Remove two screws ㊿ on the front frame.

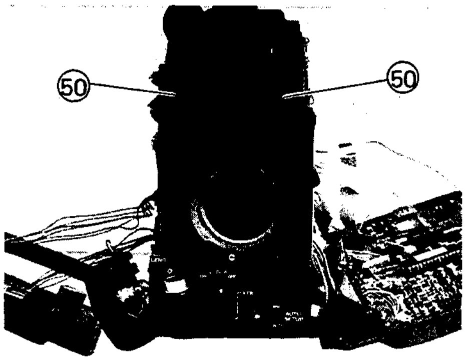


Fig. 2-5b

5. Remove a screw (51) then take off the top frame Ⓢ

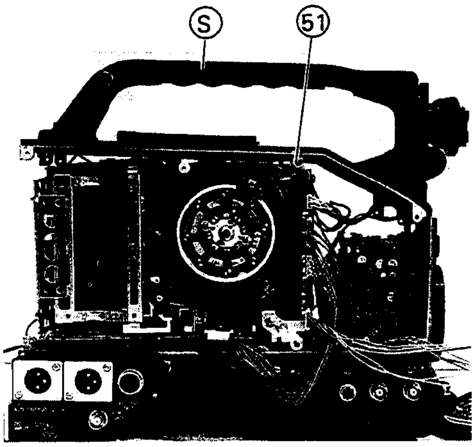


Fig. 2-5c

2.3 REMOVAL OF SWITCH BOX AND CONNECTOR BOX

- **Before proceeding to the following steps, remove the screws ⑤ and shoulder pad.**

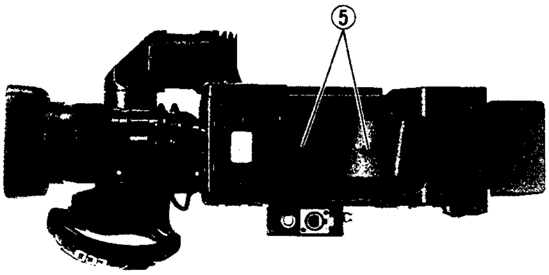


Fig. 2-6

2.3.1 Switch box (in right front part)

1. Remove the right side cover according to the section 2.2.1.
2. Remove a screw ⑥.

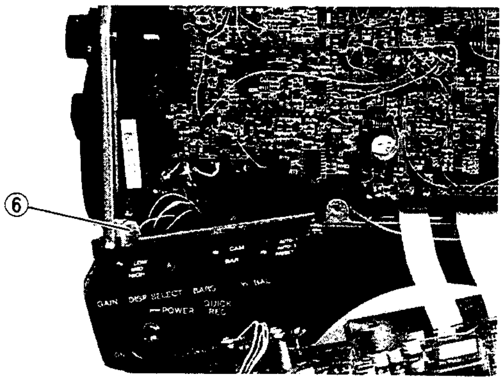

⑥
GAIN
DISP SELECT
BARS
POWER
QUICK REC
CAM
BAR

Fig. 2-7

3. Remove a screw ⑦ to detach the switch box Ⓐ.

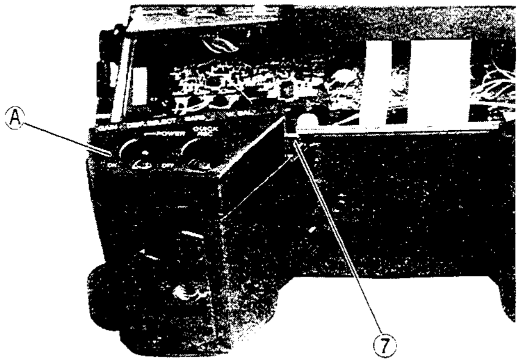

Ⓐ
⑦
POWER
QUICK REC

Fig. 2-8

2.3.2 Connector box (in left front part)

- Remove the shoulder pad according to the Fig. 2-6.

1. Take off the left side cover according to the section 2.2.2.
2. Remove a screw ⑧.

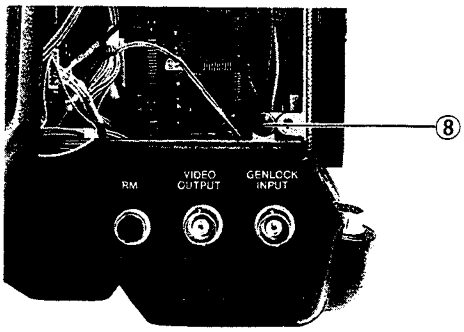

⑧
RM
VIDEO OUTPUT
GENLOCK INPUT

Fig. 2-9

3. Remove two screws ⑨ to detach the connector box Ⓑ.

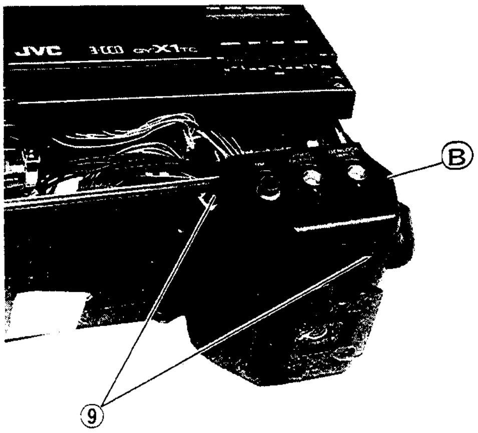


Fig. 2-10

2.3.3 Connector box (in left rear part)

- Remove the shoulder pad according to the Fig. 2-6.

1. Remove a screw ⑩ from the rear part.

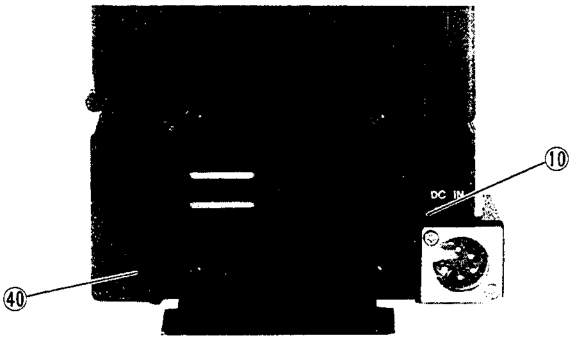


Fig. 2-11a

2. Remove two screws ⑪ to detach the connector box Ⓒ.

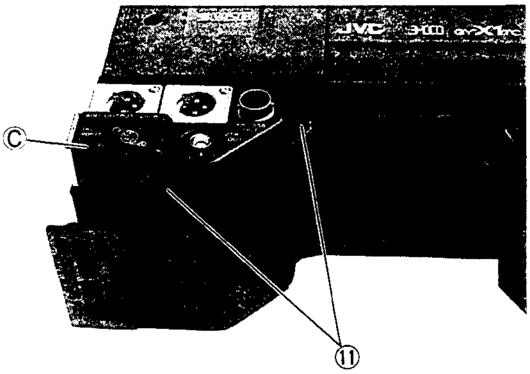


Fig. 2-11b

2.3.4 Battery box (in right rear part)

- Remove the shoulder pad according to the Fig. 2-6.

1. Remove a screw ㊵ on the rear part. (Fig. 2-11a)
2. Remove a screw ㊶ then take off the battery box Ⓟ.

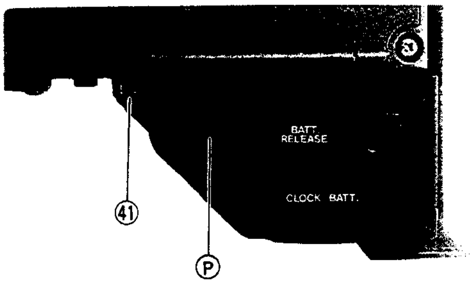
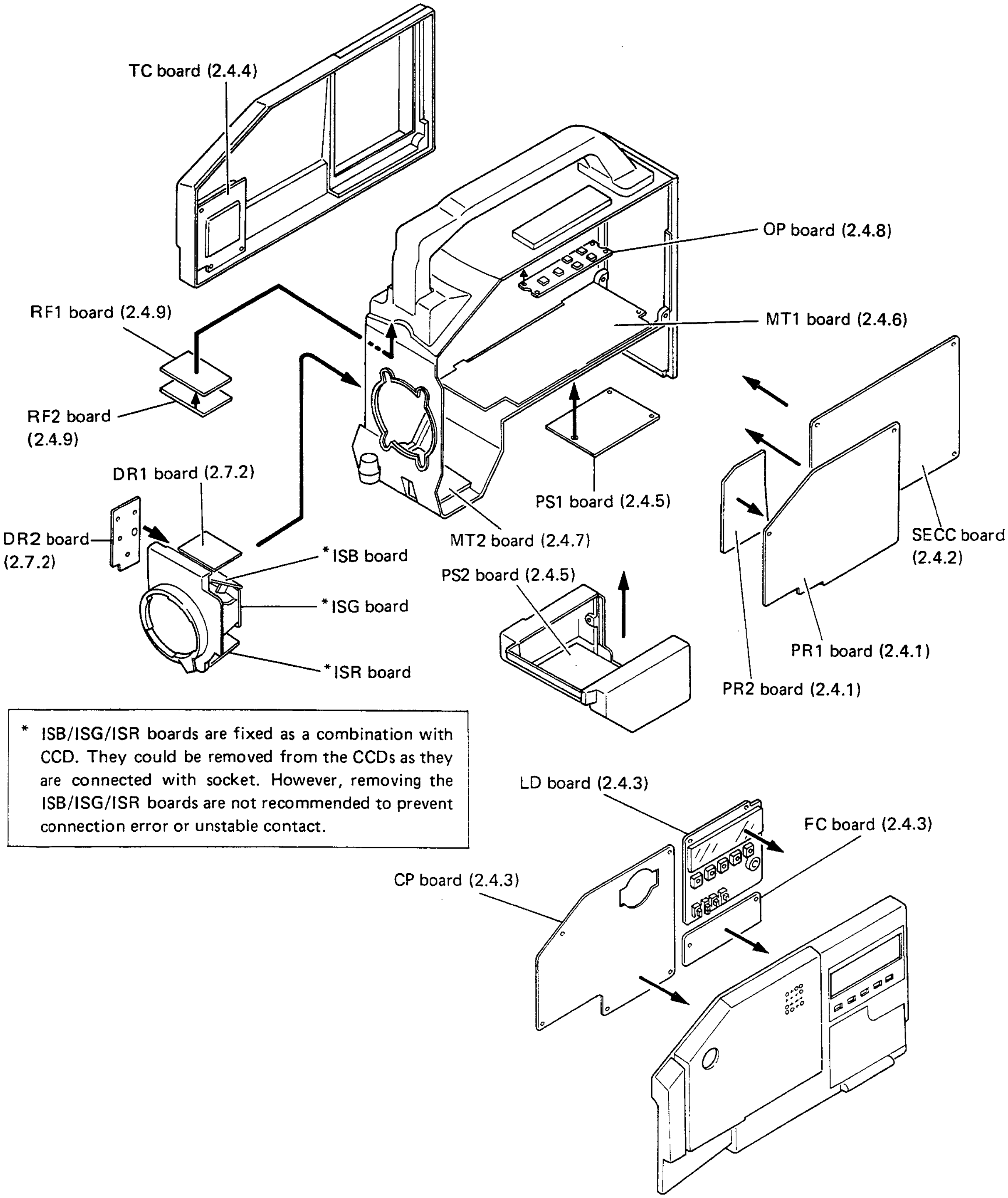


Fig. 2-11c

2.4 REMOVAL OF MAIN BOARDS

Note: Figures in parentheses ( ) show article numbers of the items.


TC board (2.4.4)
OP board (2.4.8)
RF1 board (2.4.9)
MT1 board (2.4.6)
RF2 board (2.4.9)
DR1 board (2.7.2)
PS1 board (2.4.5)
DR2 board (2.7.2)
MT2 board (2.4.7)
SECC board (2.4.2)
*ISB board
PS2 board (2.4.5)
*ISG board
*ISR board
PR1 board (2.4.1)
PR2 board (2.4.1)
LD board (2.4.3)
FC board (2.4.3)
CP board (2.4.3)

* ISB/ISG/ISR boards are fixed as a combination with CCD. They could be removed from the CCDs as they are connected with socket. However, removing the ISB/ISG/ISR boards are not recommended to prevent connection error or unstable contact.

Fig. 2-12 Principal circuit boards allocation

2.4.1 PR board

- The PR board is composed of two parts. The upper one is the PR1 board and the lower one is the PR2 board.

1. Take off the right side cover referring to the section 2.2.1.
2. Remove two screws ⑫, and the PR board can be pulled down to this side.

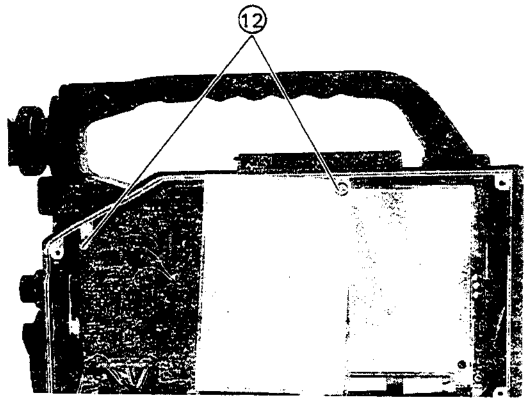


Fig. 2-13

3. The PR board is connected with the SECC board by the connector Ⓓ.
   The PR board can be separated from the SECC board by drawing it to this side. At that time, be careful not to damage component parts.

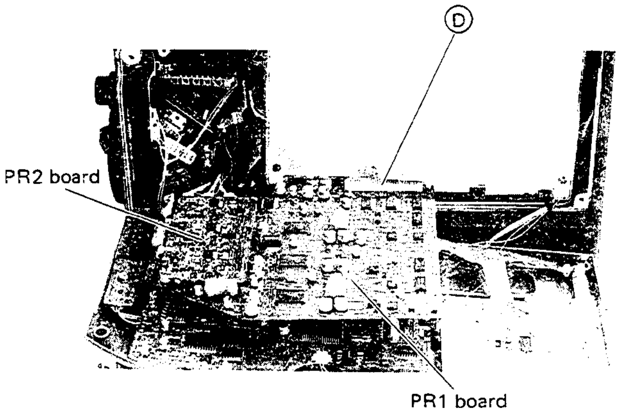


Fig. 2-14

2.4.2 SECC board

1. Referring to the section 2.4.1, remove the PR board first.
2. Remove four screws ⑬ to detach the SECC board.

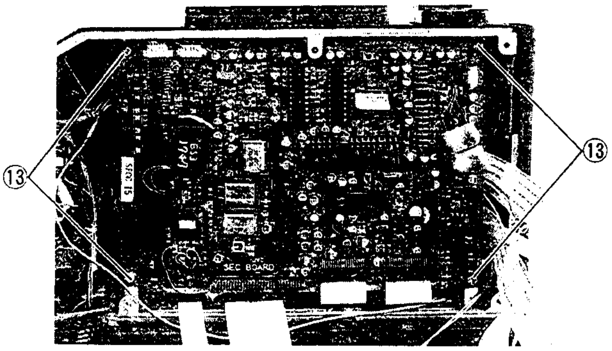


Fig. 2-15

2.4.3 CP, LD, FC boards

- The CP, LD, FC boards are located inside the right side cover.

1. The CP board can be detached by removing four screws ⑭.
2. The LD board can be detached by removing four screws ⑮.
3. The FC board can be detached by removing three screws ⑯.

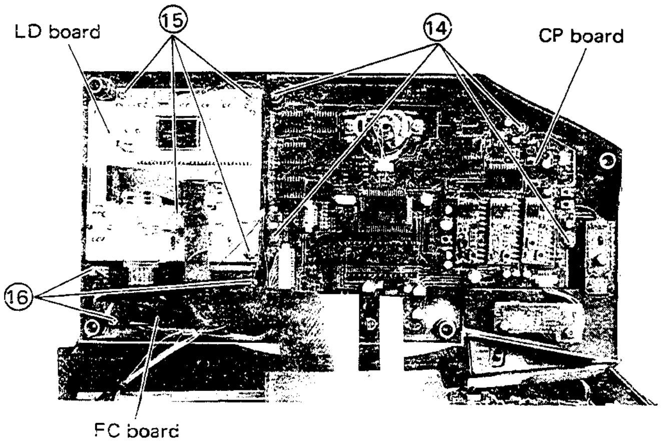


Fig. 2-16

2.4.4 TC board (GY-X1TC only)

1. The TC board is located inside the left side cover.
   It can be detached by removing four screws ⑰.

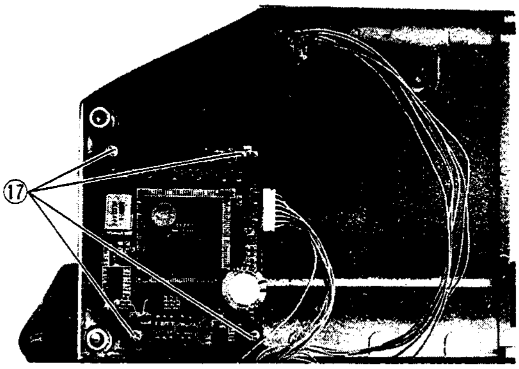


Fig. 2-17

2.4.5 PS1/PS2 boards

1. Remove the connector box in the left rear part first according to the section 2.3.3.
2. Also remove the battery box which is in the right rear part according to the section 2.3.4.
3. Take off the rear cover according to the section 2.2.3.
4. Remove a screw ⑱ from the rear bottom cover Ⓔ.

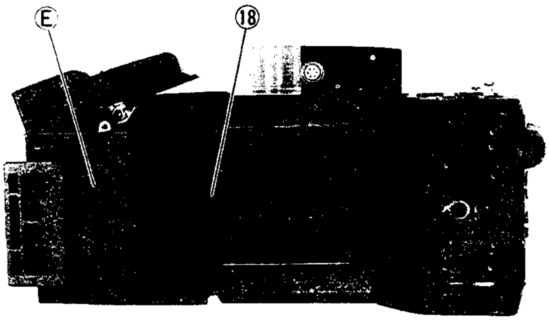


Fig. 2-18

5. When the rear bottom cover is taken off, the PS1 board is exposed.
   The PS1 board can be detached by removing three screws ⑲.
6. The PS2 board is located inside the rear bottom cover.
   The PS2 board can be detached by removing three screws ⑳.

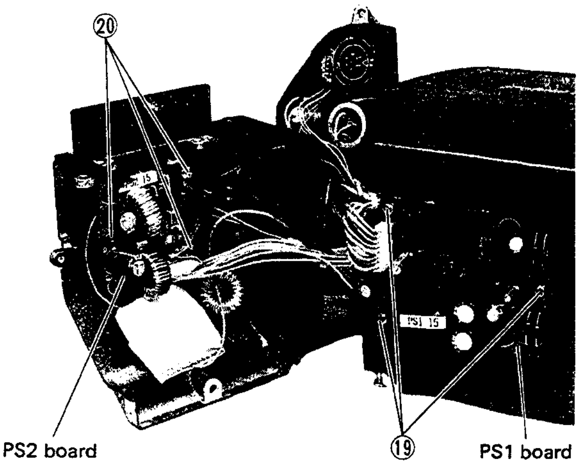


Fig. 2-19

2.4.6 MT1 board

- **It is hard to detach the MT1 board. However, by removing the PS1 board, semiconductors on the MT1 board can be checked up from the bottom chassis side.**
  Before proceeding to detach the MT1 board, check up these semiconductors.

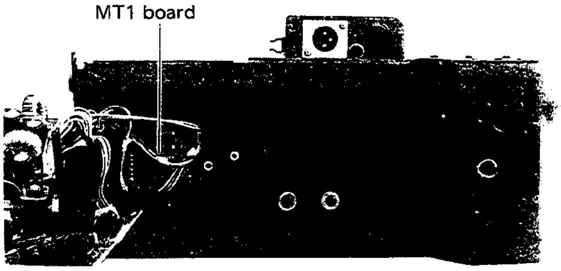


Fig. 2-20

1. Remove the top frame referring to the section 2.2.4.
2. Remove the VTR assembly referring to the section 2.8.
3. The MT1 board is located inside the bottom chassis.
   The board can be detached by removing two screws ㉑.

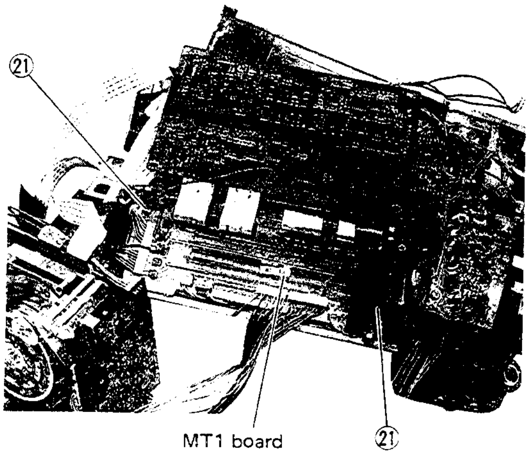


Fig. 2-21

2.4.7 MT2 board

1. Remove the top frame referring to the section 2.2.4.
2. Detach the optical block referring to the section 2.7.1.
3. The MT2 board is located on the internal front side of the bottom cover.
   The board can be detached by removing two screws ㉒.

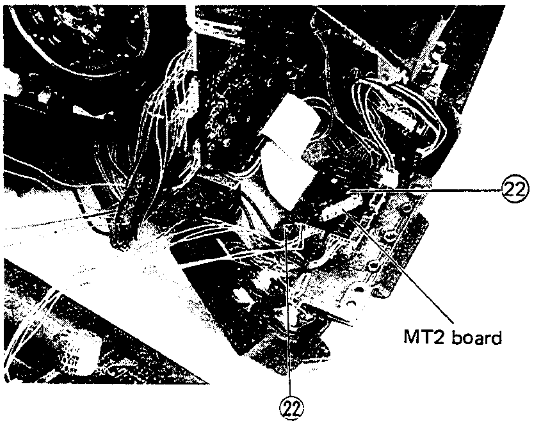


Fig. 2-22a

2.4.8 OP board

1. Open the cover of the VTR operation section and remove two screws ㊷ to detach the base.
2. The OP board is provided behind the base.

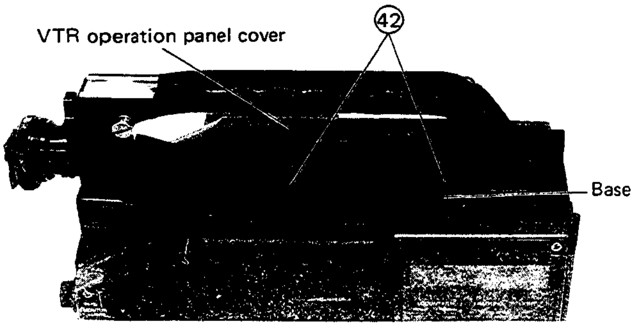


Fig. 2-22b

2.4.9 RF1/RF2 boards

1. Remove the optical block according to the section 2.7.1.
2. Remove two screws ㊸ and a screw ㊹ then take off the RF1/RF2 boards.

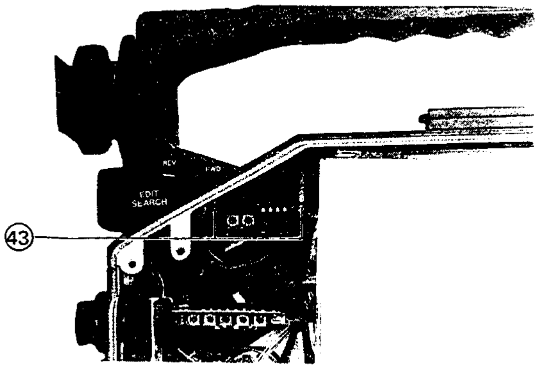


Fig. 2-22c

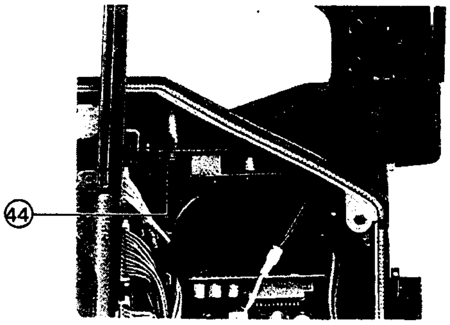


Fig. 2-22d

2.5 REPLACEMENT OF MICROPHONE

1. Remove two screws ㊸ and take off the dust cover Ⓕ.
2. Remove the left side cover and disconnect the connector Ⓠ.

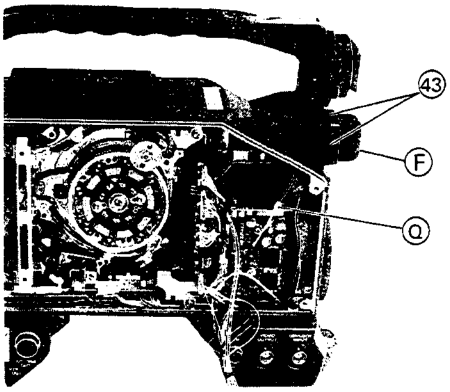


Fig. 2-23

3. Remove two screws ㉓ and the microphone can be drawn out.

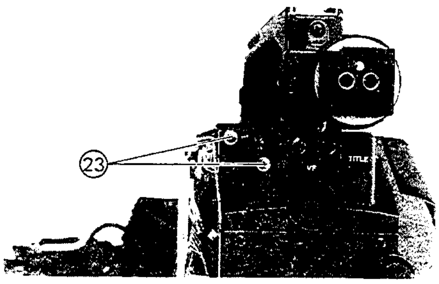


Fig. 2-24

2.6 REPLACEMENT OF CLOCK BATTERY

1. The clock battery is stored inside the left rear cover. For battery replacement, pull the cover to this side by an ordinary (—) screwdriver. Use a battery as specified. (Item No. CR2025/1BPNV)

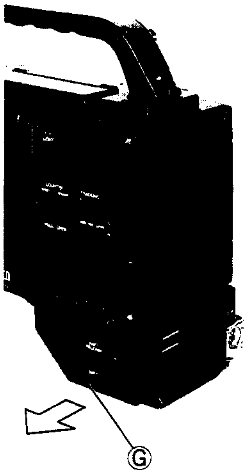


Fig. 2-25

2.7 OPTICAL BLOCK

2.7.1 Removal of optical block

1. Remove two screws ㉔ from the front side of the bottom cover.

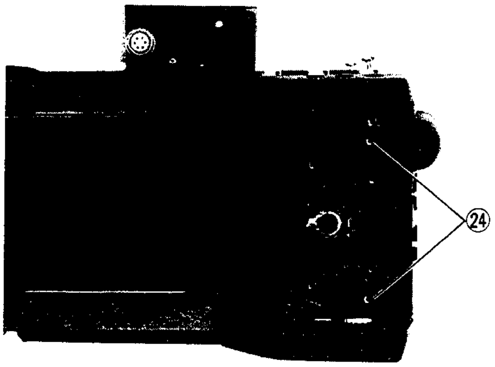


Fig. 2-26

2. Take off the right and left side covers referring to the sections 2.2.1 and 2.2.2.
3. Remove the switch box in the right front part and the connector box in the left front part referring to the sections 2.3.1 and 2.3.2.
4. Remove two screws ㉕ and the optical block can be drawn out together with the front frame.

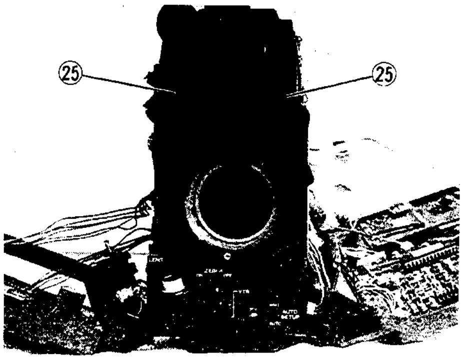


Fig. 2-27

5. Disconnect six connectors Ⓗ, Ⓘ, Ⓙ to detach the the optical block completely.
   Ⓗ : Connector of PR board
   Ⓘ : Connector of MT1 board
   Ⓙ : Connector of MT2 board

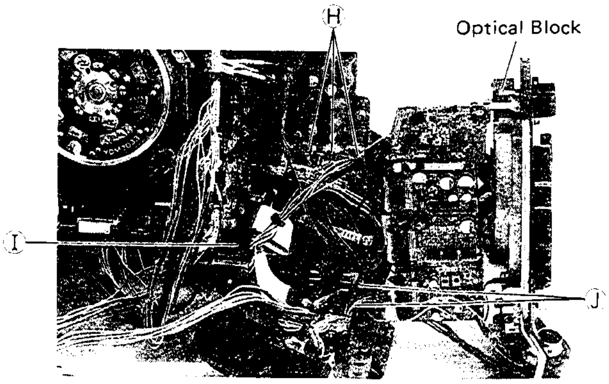


Fig. 2-28

2.7.2 Removal of boards

1. Remove two screws ㉖ from the upper part of the optical block, and then the DR1 board can be removed.

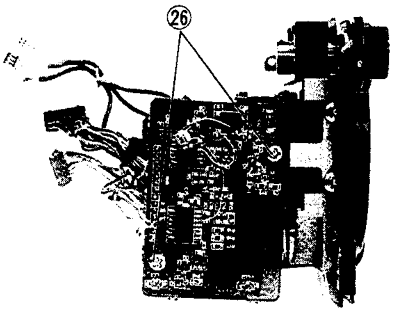


Fig. 2-29

2. Remove two screws ㉗ from the left side of the optical block, and the DR2 board can be removed.

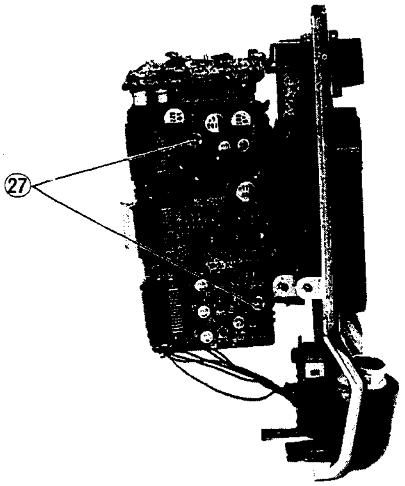


Fig. 2-30

2.7.3 Replacement of CCD assembly

- The CCD cannot be replaced with another alone, and it needs to replace with the whole of the optical block.

1. Loosen a screw Ⓚ with a hex. wrench and remove the filter knob Ⓛ.
2. Remove four screws ㉘ and detach the front frame Ⓜ

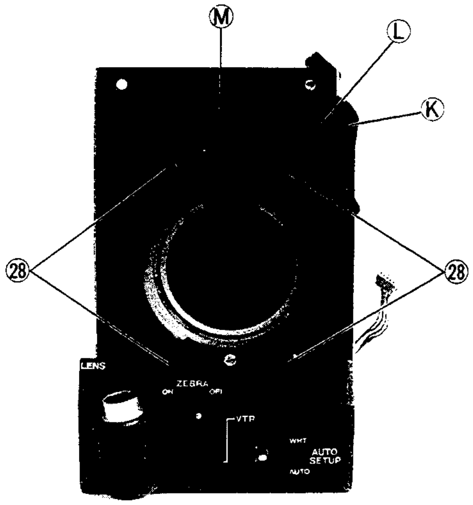
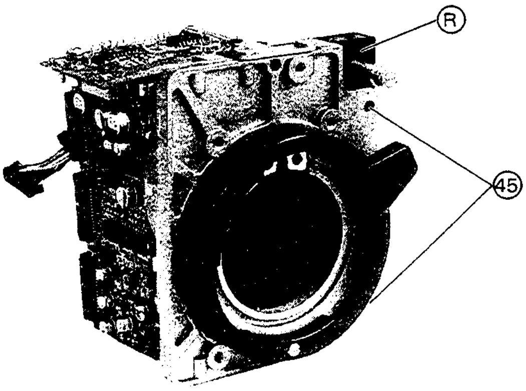


Fig. 2-31

3. **An optical block assembly provided as service parts does not include the filter unit and DR1/DR2 boards.**

   (The filter unit can be removed by removing two screws ㊺.)

   Assemble the filter unit Ⓡ and DR1/DR2 boards which are disassembled from the old assembly to new one, and then install it to the front frame.



Optical Block

Fig. 2-32

2.8 REMOVAL OF VTR ASSEMBLY

1. Remove the left side cover according to the section 2.2.2.
2. Remove two screws ㉙ on the rear panel.

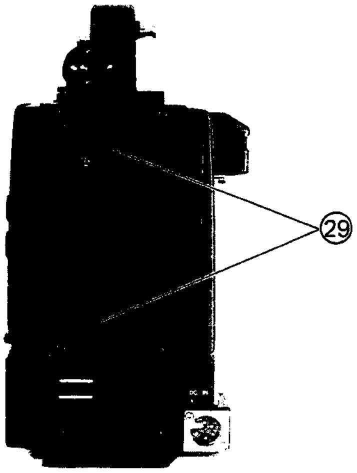


Fig. 2-33

4. Remove two screws ㉚ and then the VTR assembly Ⓝ can be drawn out.
   For replacement of boards and parts of the VTR assembly, refer to the section 1 of the VTR part of this manual.

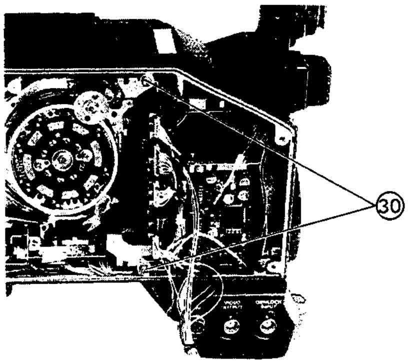


Fig. 2-34

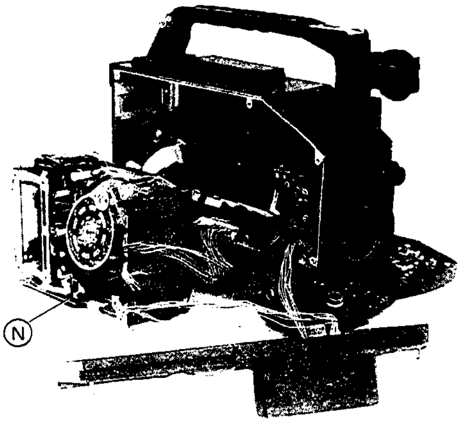


Fig. 2-35

In case of replacing the drum head assembly with new one, resetting the internal hour meter is nessary. For resetting manner, refer to the section 2.10.6.

2.9 INTERNAL SWITCH FUNCTIONS OF CAMERA

2.9.1 Switches of TC board (GY-X1TC only)

- Switches are provided behind the TC board. Remove the TC board first according to the section 2.4.4.

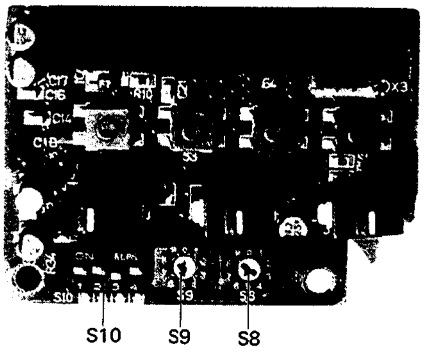
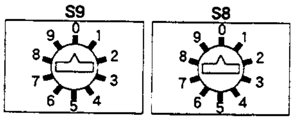


Fig. 2-36

1. S8, S9 (Rotary switches)

These switches are used for setting lines where VITC's are inserted into. (In order to prevent misreading caused by dropout, a set of VITC's is inserted in respective lines of a field.)



- S8 Setting at shipment: 6

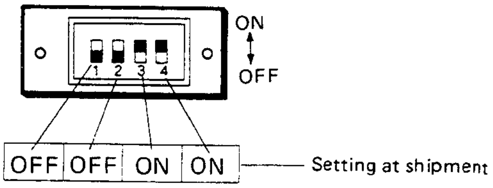
SW No.	0	1	2	3	4	5	6	7	8	9
Inserted line	7H	8H	9H	10H	11H	12H	13H	14H	15H	16H

- S9 Setting at shipment: 8

SW No.	0	1	2	3	4	5	6	7	8	9
Inserted line	7H	8H	9H	10H	11H	12H	13H	14H	15H	16H

2. SW10 (DIP switch)

This switch is used for the following purposes by on/off setting.

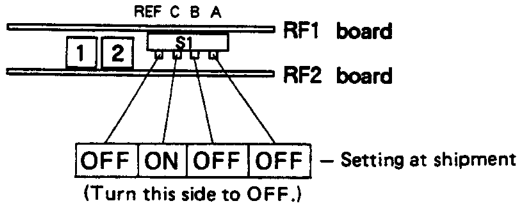


- 1 Output selector switch
  ON : To output VITC and LTC*
  OFF : To output VITC only
  Note : To record LTC, it needs to switch SW1 of the IF board. (Refer to the section 2.9.3.)
- 2 BM on/off switch
  Set to OFF.
- 3 NTSC/PAL selector switch
  ON : PAL
  OFF : NTSC
- 4 Drop frame correction switch
  ON : For drop frame mode with drop frame correction
  OFF : For non-drop frame mode without drop frame correction

2.9.2 Switches of RF board (GY-X1TC only)

1. S1 (DIP switch)

- Pull down the PR board according to the section 2.4.1 to see the RF1/RF2 boards under the top frame.



- REF AEQ reference signal termination switch
  OFF : To insert the reference signal for the AEQ circuit into H blankings.
  ON : Reference signal is not inserted.

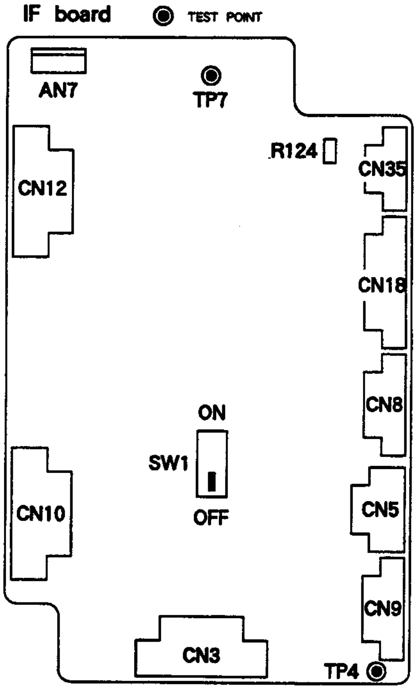
  Note: The AEQ circuit is provided in BR-S611 and BR-S811 for automatic correction of the frequency response.

A
B
C – To set insertion position of the reference signal into H. blanking.

	20H	19H	18H	17H	16H	15H	14H	None
A	OFF	ON	OFF	OFF	ON	ON	OFF	ON
B	OFF	OFF	ON	OFF	ON	OFF	ON	ON
C	OFF	OFF	OFF	ON	OFF	ON	ON	ON

2.9.3 Switches of IF board (VTR section)

1. SW1 (Slide switch)
   ON : To record LTC on the normal audio track.
   In this case, the Hi-Fi audio track is ineffectual for recording.
   OFF : Not to record LTC
   (Initial setting at shipment)



Note: To record LTC, it needs to turn on SW10-1 of the TC board. (Refer to the section 2.9.1.)

2.9.4 Switch of CP board

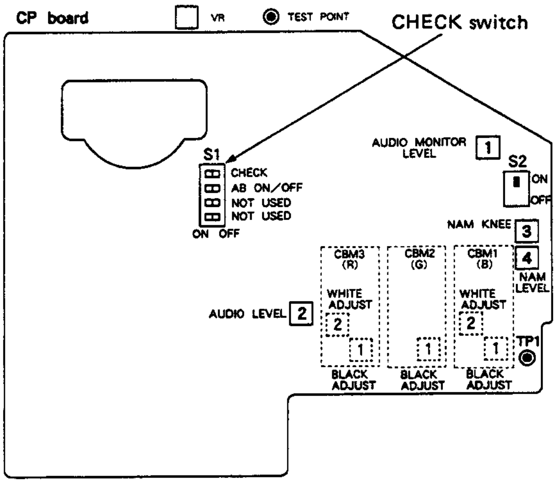
1. S1 - CHECK
   Refer to the section 2.10 "CPU Service Mode".
2. S1 - AB ON/OFF
   Used for electrical adjustments.
   Normally, it must be set to OFF.
3. S2 (Slide switch)
   Used for switching on/off of the VTR playback audio and microphone audio to the monitor speaker.
   For U version : Set to OFF.
   For E version : Set to ON.

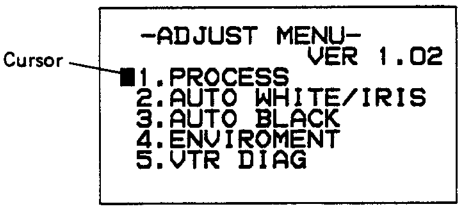
2.10 CPU SERVICE MODE

There is CPU service mode provided in the GY-X1TC/GY-X1, and it is for use of electrical adjustment and checkup of the VTR section.

2.10.1 To set to CPU service mode

The CPU service mode is effectual by turning on S1 - CHECK of the CP board, and the main adjustment menu (ADJUST MENU) will be displayed in the viewfinder.


CP board
VR
TEST POINT
CHECK switch
S1
CHECK
AB ON/OFF
NOT USED
NOT USED
ON OFF
AUDIO MONITOR LEVEL 1
S2
ON
OFF
NAM KNEE 3
4 NAM LEVEL
CBM3 (R)
CBM2 (G)
CBM1 (B)
WHITE ADJUST 2
AUDIO LEVEL 2
1
TP1
BLACK ADJUST
BLACK ADJUST
BLACK ADJUST



```
  -ADJUST MENU-
            VER 1.02
■1.PROCESS
 2.AUTO WHITE/IRIS
 3.AUTO BLACK
 4.ENVIROMENT
 5.VTR DIAG
```

ADJUST MENU (main adjustment menu)

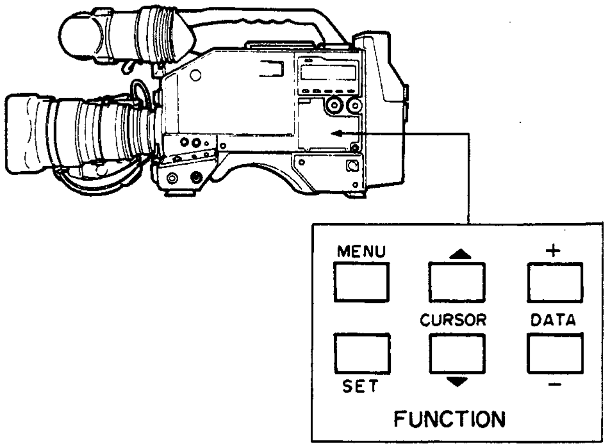
In the CPU service mode the camera sensitivity is forcibly set to 0 dB/9 dB/18 dB.

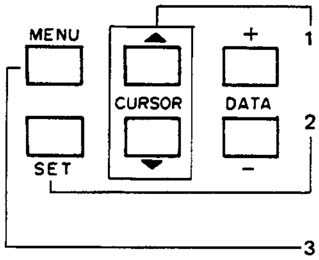
In this mode, character indications for the normal mode (Title, Warning, Memory function menu, etc.) cannot be displayed at all.

Make sure to turn off S1 - CHECK of the CP board after servicing.

2.10.2 Usage of ADJUST MENU

In order to activate the service mode for servicing operations, press buttons of the function box (shown below).


MENU
CURSOR
DATA
+
SET
−
FUNCTION


MENU
+
CURSOR
DATA
SET
−

1 Move the cursor to a required number (item).

2 Press the SET button.
The mode is shifted to the selected one. (Refer to each item of the following.)

3 Press the MENU button.
The ADJUST MENU (main menu) will be displayed.

2.10.3 "1. PROCESS"

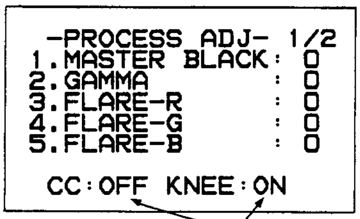
This mode is used for adjustment of signal systems. Detail of adjustments will be described in Section 3. Electrical Adjustment.

The submenu of this item is displayed in two pages.

In the mode of this menu, the camera's operation mode is set as follows.

- ABL : ON
- AUTO KNEE : OFF
- Analog data set by user : 0

When the menu is returned to the ADJUST MENU (main adjustment menu), the above settings are reset to those set by the user previously.

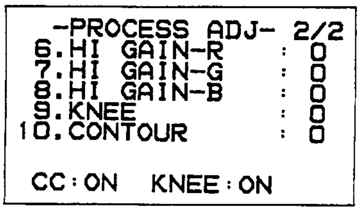


```
  -PROCESS ADJ-  1/2
 1.MASTER BLACK: 0
 2.GAMMA       : 0
 3.FLARE-R     : 0
 4.FLARE-G     : 0
 5.FLARE-B     : 0

  CC:OFF  KNEE:ON
```

Page 1

Automatically turned on/off according to a selected adjustment item.

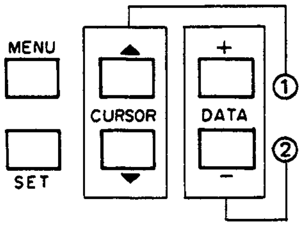


```
  -PROCESS ADJ-  2/2
 6.HI GAIN-R   : 0
 7.HI GAIN-G   : 0
 8.HI GAIN-B   : 0
 9.KNEE        : 0
10.CONTOUR     : 0

  CC:ON   KNEE:ON
```

Page 2

The value which is blinking in the display can be changed.



① To blink the displayed value.

② To change the blinking value.

③ Repeat ① and ② as required.

Note:

- To change the displayed page to the other, go on pressing the CURSOR button.
- To return to the ADJUST MENU (main adjustment menu), press the MENU button.
- Don't change the displayed adjustment values unreasonably. For respective adjustment values and adjustment procedures, refer to Section 3.

2.10.4 "2. AUTO WHITE/IRIS"

This mode is for signal adjustment whose detail is described in Section 3 Electrical Adjustment.

```
    -AW/AI  ADJ-

       R     165
       G     171
       B     168
      NAM    1

 ADJUST  R/B  LEVEL
      NAM    165
```

The displayed values cannot be changed by the DATA button. For adjustment procedures and values, refer to Section 3.

Note: To return to the ADJUST MENU, press the MENU button.

2.10.5 "3. AUTO BLACK"

This mode is for adjustments of signal system, too.

```
       -AB  ADJ-

         R    80
         G    95
         B    94

 ADJUST  R/G/B  LEVEL
              128
```

The DATA button is ineffective for changing the displayed values. For adjustment procedures and values, refer to Section 3.

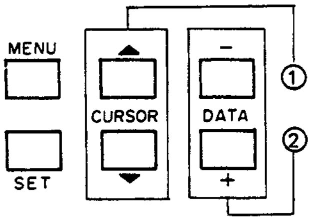
Note: To return to the ADJUST MENU, press the MENU button.

2.10.6 "4. ENVIRONMENT"

This mode is used to set the power voltage display and the integrating hour meter display.

```
 -ENVIROMENT  SET-
 1.BATT  VOLTAGE  ADJ
                12.00V
 2.HOUR  METER  CLEAR
                   00H
```

The displayed value which is blinking can be changed.



① To blink a value to change.

② To change the blinking value.

③ Repeat ① and ② as required.

Note:

- "BATT VOLTAGE ADJ" has a function to equalize the actual voltage appearing in the status display to the source voltage when they are different from each other.
- Don't change the displayed value of the HOUR METER except in a very special case.
- To return the display to the ADJUST MENU, press the MENU button.

2.10.7 "5. VTR DIAG"

This submenu is for operation check of the VTR assembly. The menu consists of four pages.

Note:

- Before starting some operation with this menu, make sure to press the EJECT button to open the cassette holder.
- For servicing under this menu, prepare a recorded VHS C or S-VHS C cassette tape.
- To return the menu to the ADJUST MENU, press the MENU button.

1. Confirm the indications of ① through ③.

```
     -VTR  DIAG-      1/4
 SENSOR  CHECK

    CASSETTE  IN  :OFF  ①
    REC  SAFE     :OFF  ②
    TAPE  END     :OFF  ③

    PUSH  SET  SW  :■
```

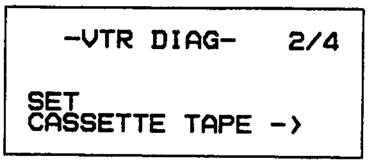
Page 1 (Sensor check)

① Indicates the state of the cassette sensor which detects loading/unloading of a cassette.

② Indicates the state of the safety tab (REC prevention tab) sensor.

③ Indicates the state of the end sensor.

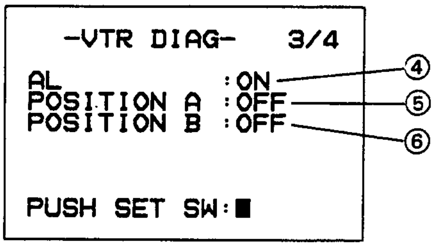
2. Press the SET button and the page is turned over.



```
   -VTR DIAG-    2/4

SET
CASSETTE TAPE ->
```

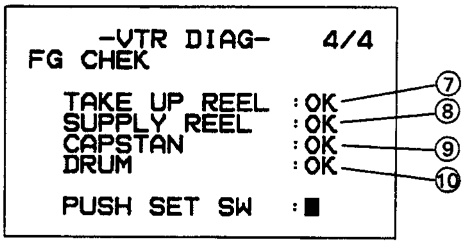
3. Load a cassette and close the cassette holder. The menu is automatically turned over to the 3rd page.



```
   -VTR DIAG-    3/4
AL          :ON
POSITION A  :OFF
POSITION B  :OFF

PUSH SET SW:■
```

4. As a cassette is loaded, indications of ④ through ⑥ change from ON to OFF and vice versa.
   When there is no change in the indication, it is required to inspect something abnormal in the loading mechanism or the loading condition of the cassette.
5. To turn over the page to the next, press the SET button again (in this case, the 4th page will be displayed).



```
     -VTR DIAG-    4/4
FG CHEK

   TAKE UP REEL  :OK
   SUPPLY REEL   :OK
   CAPSTAN       :OK
   DRUM          :OK

   PUSH SET SW   :■
```

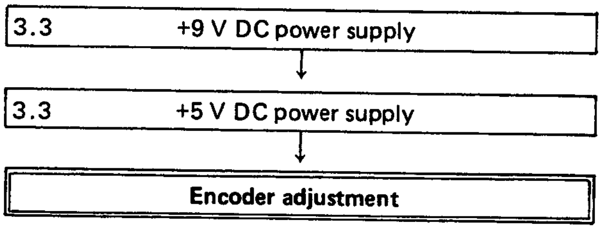
6. The loaded tape is played for a few seconds and the playback automatically stops.
7. Aporoximately 15 seconds later, respective items of ⑦ to ⑩ are checked and the results are indicated by NG or OK. When any item is indicated by NG, there may be something abnormal in its servo system or there is nothing recorded on the tape.
8. To return the menu to the main menu (ADJUST MENU) press the SET button.

SECTION 3
ELECTRICAL ADJUSTMENT

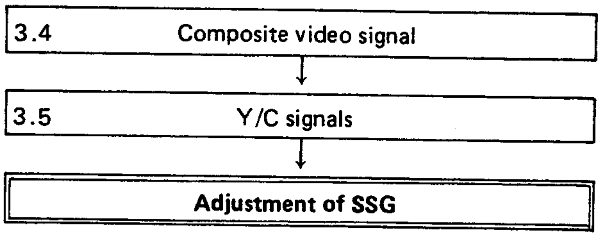
- This section describes electrical adjustments of the camera head only.
  For adjustments of the VTR section, refer to the sections 2 and 3 of "VTR Assembly".
- Data that the use has set will not change by electrical adjustment owing to the memory function.
  However, when the reference value(s) is changed by adjustment, picture quality based on the user's data won't be obtained in spite of the same data value. Make sure to explain this matter to the user before proceeding to adjustment.

3.1 FLOWCHART OF ELECTRICAL ADJUSTMENT

3.1.1 Adjustment of power supply voltage

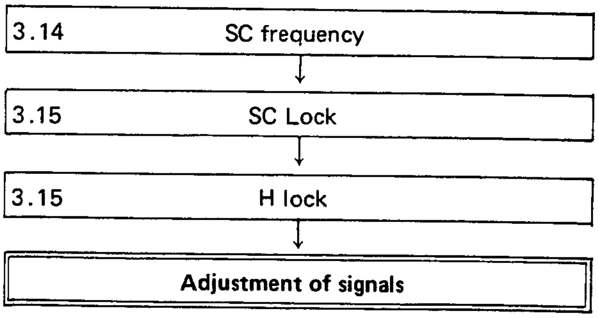

3.3 +9 V DC power supply
3.3 +5 V DC power supply
Encoder adjustment

3.1.2 Adjustment of encoder

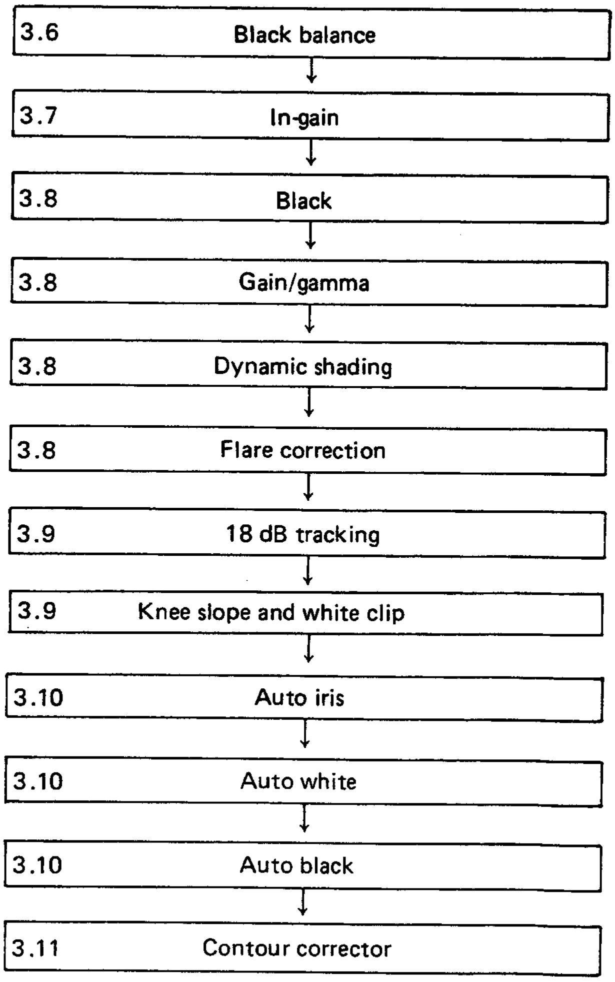

3.4 Composite video signal
3.5 Y/C signals
Adjustment of SSG

3.1.3 Adjustment of SSG (Reference signal generator)

Note: This adjustment is not required generally.
Proceed to the following steps of the "Adjustment of Signals" starting with 3.6.


3.14 SC frequency
3.15 SC Lock
3.15 H lock
Adjustment of signals

3.1.4 Adjustment of signals

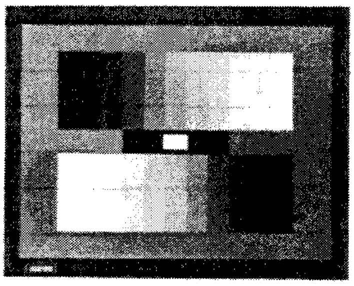
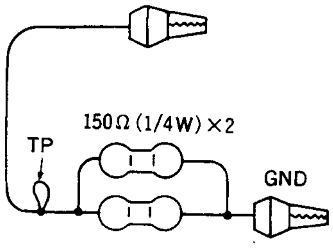

3.6 Black balance
3.7 In-gain
3.8 Black
3.8 Gain/gamma
3.8 Dynamic shading
3.8 Flare correction
3.9 18 dB tracking
3.9 Knee slope and white clip
3.10 Auto iris
3.10 Auto white
3.10 Auto black
3.11 Contour corrector

3.2 REQUIRED EQUIPMENT AND STANDARD SETUP FOR ELECTRICAL ADJUSTMENT

3.2.1 Necessary equipment

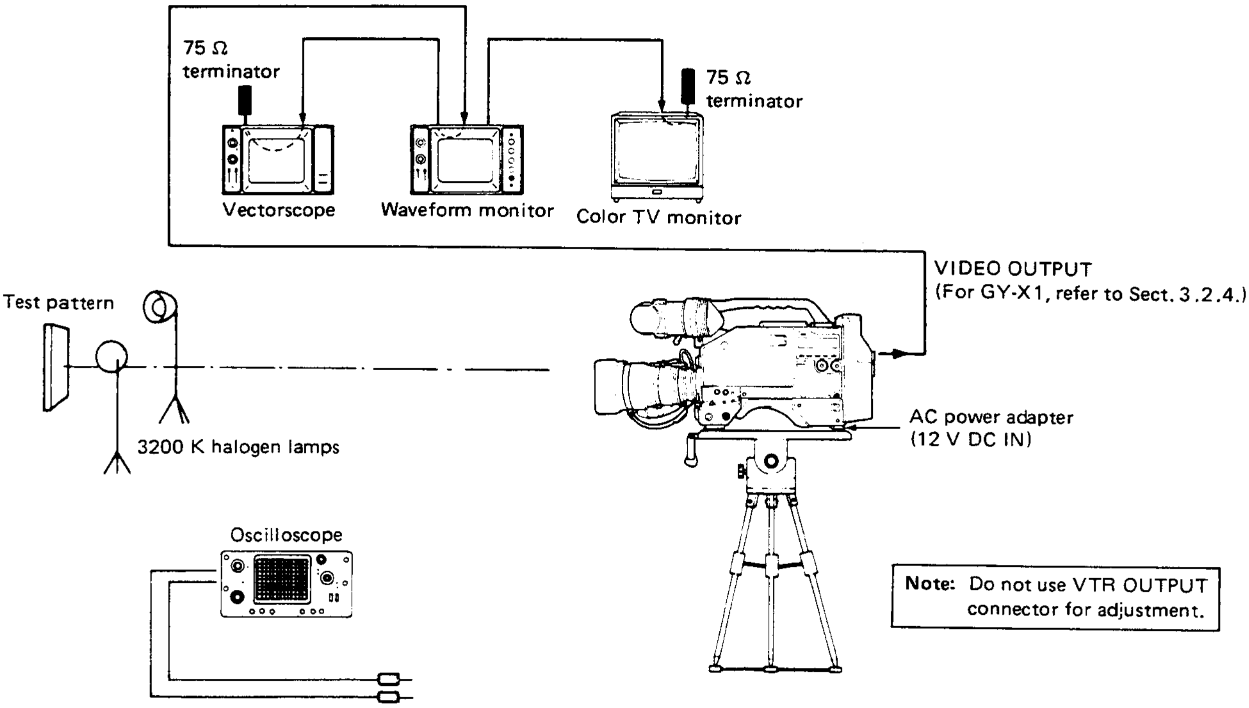
1. Lighting apparatus (3200 K halogen lamps)
2. DC voltmeter (digital voltmeter is preferable)
3. Oscilloscope (dual-trace type is preferable)
4. Frequency counter
5. Color TV monitor
6. Waveform monitor
7. Vectorscope
8. 12 V DC power source (AC power adapter, etc.)
9. Lens : HZ-714 or equivalent
10. Oscillator (–60 dB/1 kHz available)
    (to be used for audio level adjustment)

3.2.2 Required devices

1	Gray scale chart (GS-2L)	2	75 Ω terminator
		 150Ω (1/4W) ×2 TP GND	

Note: Prepare a device of the above 2 by yourself.

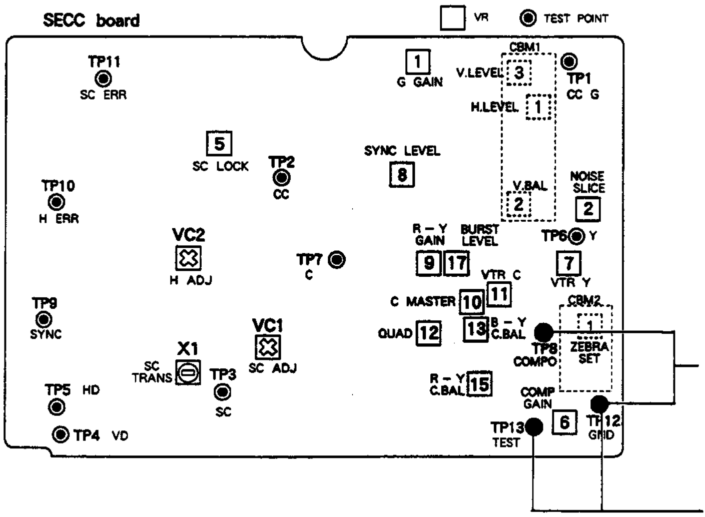
3.2.3 Standard setup


75 Ω
terminator
75 Ω
terminator
Vectorscope
Waveform monitor
Color TV monitor
VIDEO OUTPUT
(For GY-X1, refer to Sect. 3.2.4.)
Test pattern
3200 K halogen lamps
AC power adapter
(12 V DC IN)
Oscilloscope

Note: Do not use VTR OUTPUT connector for adjustment.

3.2.4 VIDEO OUTPUT connector (only in GY-X1)

The VIDEO OUTPUT connector is provided only in the model GY-X1TC.
For servicing of the model GY-X1, use the test point on the SECC board for this connector (see figure below).


SECC board
VR
TEST POINT
TP11
SC ERR
TP10
H ERR
TP9
SYNC
TP5 HD
TP4 VD
5
SC LOCK
TP2
CC
VC2
H ADJ
TP7
C
X1
SC TRANS
TP3
SC
VC1
SC ADJ
1
G GAIN
CBM1
V.LEVEL 3
H.LEVEL 1
TP1
CC G
SYNC LEVEL
8
V.BAL
2
NOISE SLICE
2
R-Y GAIN
BURST LEVEL
9
17
TP6 Y
7
VTR C
VTR Y
C MASTER 10
11
CBM2
1
QUAD 12
13
B-Y C.BAL
TP8 COMPO
ZEBRA SET
R-Y C.BAL 15
COMP GAIN
6
TP13 TEST
TP12 GRID

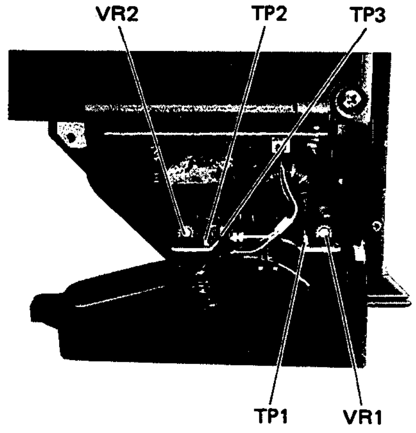
Attach the 75 Ω termination jig, then connect an oscilloscope.

Connect a shunt wire between TP12 and TP13.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

3.3 ADJUSTMENT OF POWER SUPPLY (PS) VOLTAGES

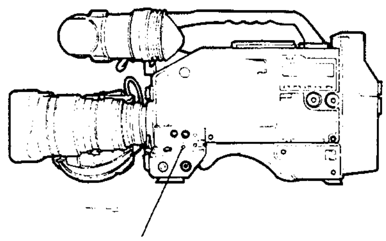
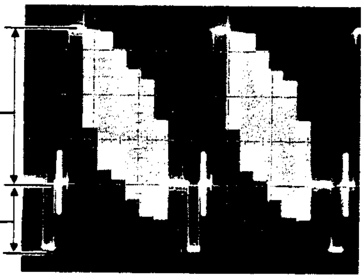
- Adjustment parts are located on the PS2 board. Before proceeding to the adjustment, take off the rear right cover according to Section 2.3.4.

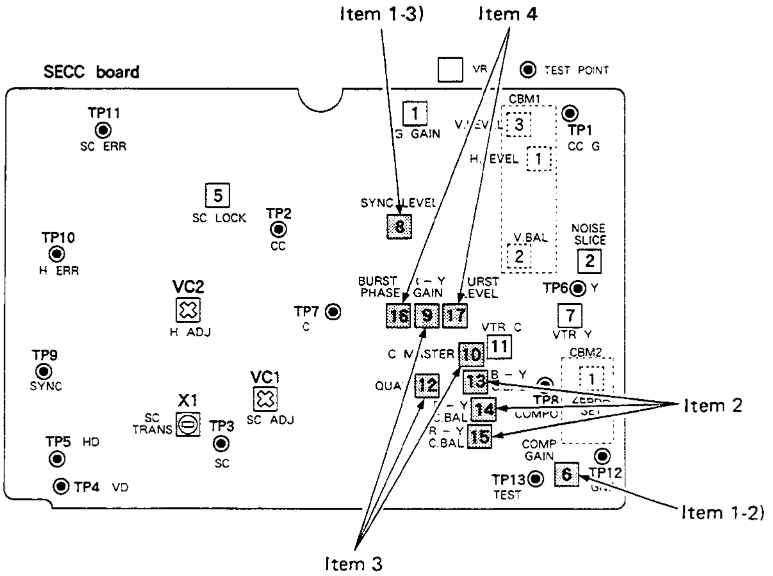
1	+9.8 V DC power supply	Digital voltmeter	◎ TP1 [PS2] Ⓣ +9.8 V ADJ [PS2] (VR1) ☆ +9.8 V DC 	• Adjust R1 to obtain the specified value.
2	+5 V DC power supply		◎ TP3 [PS2] Ⓣ +9 V ADJ [PS2] (VR2) ☆ +5 V ± 0.1 V DC	• Adjust R2 to obtain the specified value.
3	+9 V DC power supply		◎ TP3 [PS2] ☆ +9 V DC	• Confirm the level.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⦶) Adjustment level (☆)	Adjustment procedure

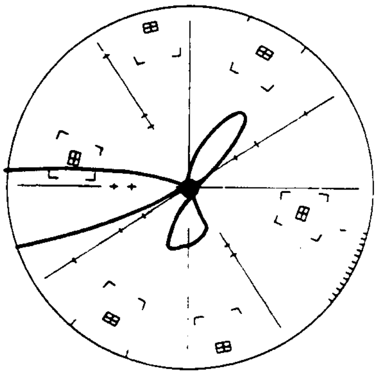
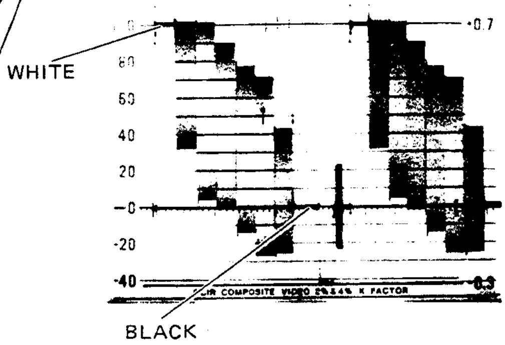
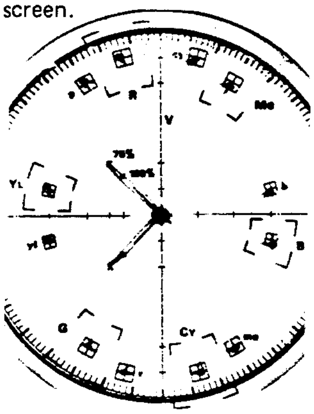
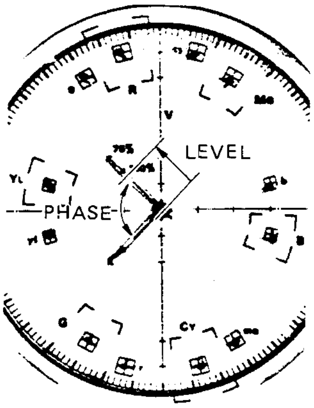
3.4 ENCODER ADJUSTMENT - 1 (Adjustment of composite signal)

- If the following adjustments will be performed without any vectorscope, it should be carried out with adjustment and checkup of only the item No. 1 'Bar level' and item No. 2 'Carrier balance'.

1	Bar level	Waveform monitor or Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. ⦶ COMP. GAIN [SECC] (VR6) ☆ 0.7 Vp-p ◎ SYNC LEVEL [SECC] (VR8) ☆ 0.3 Vp-p	1) Set the MODE switch to BARS.  MODE switch : BARS 2) Adjust Y signal level as specified.  3) Adjust sync. level to be the specified value.

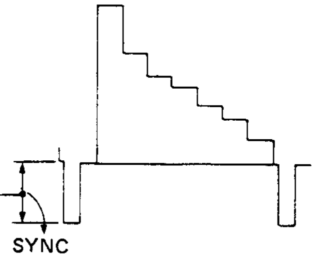
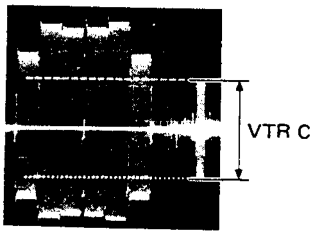


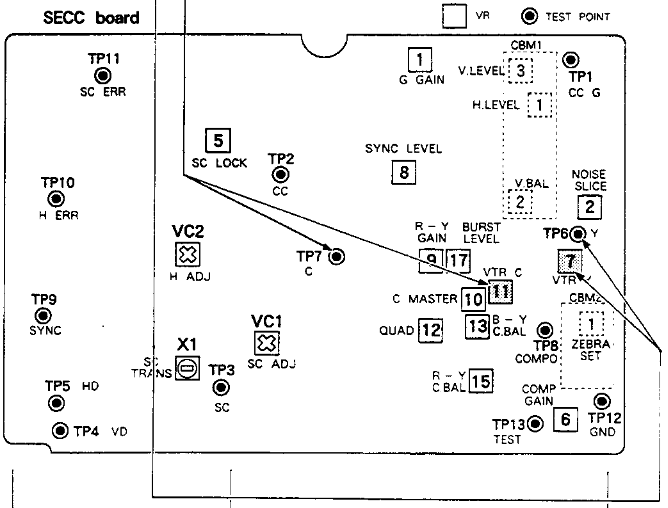
Item 1-3)
Item 4
SECC board
VR
TEST POINT
TP11
SC ERR
5
SC LOCK
TP2
CC
TP10
H ERR
VC2
H ADJ
TP7
C
TP9
SYNC
X1
SC TRANS
TP3
SC
VC1
SC ADJ
TP5 HD
TP4 VD
1
G GAIN
V.LEVEL
3
CBM1
TP1
CC G
H.LEVEL
1
SYNC LEVEL
8
V.BAL
2
NOISE SLICE
2
BURST PHASE
16
B-Y GAIN
9
BURST LEVEL
17
TP6 Y
7
VTR Y
VTR C
11
C MASTER
10
CBM2
1
QUA
12
13
B-Y
TP8 ZEBRA
COMPO SET
B-Y C.BAL
14
R-Y C.BAL
15
COMP GAIN
6
TP12
TP13
TEST
Item 2
Item 1-2)
Item 3

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
2	Carrier balance	Waveform monitor or Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ B-Y C. BAL [SECC] (VR13) Ⓣ R-Y C. BAL [SECC] (VR15) Ⓣ R-Y C. BAL [SECC] (VR14) ☆ Minimum carrier leak **• Adjustment with a vectorscope:** 1) Set the GAIN control of the vectorscope to MAXIMUM. 2) Turn C. BAL VRs alternately to position spots in the center of the screen. 	1) Turn C. BAL VRs alternately to minimize carrier leak both of white and black levels.  WHITE BLACK 0.7 80 60 40 20 0 -20 -40 0.3
3	Chroma level	Vectorscope	◎ VIDEO OUTPUT (with 75 Ω termination) • for GY-X1, see Sect. 3.2.4. Ⓣ C. MASTER [SECC] (VR10) Ⓣ R-Y GAIN [SECC] (VR9) Ⓣ QUAD [SECC] (VR12)	1) Set the GAIN control of the vectorscope to CAL or 75% position (preset position). 2) Adjust VRs to center all spots on the vectorscope screen. 
4	Burst phase & level		◎ VIDEO OUTPUT (with 75 Ω termination) • for GY-X1, see Sect. 3.2.4. Ⓣ BURST LEVEL [SECC] (VR17) Ⓣ BURST PHASE [SECC] (VR16)	1) Adjust burst phase and level correctly. 

3.5 ENCODER ADJUSTMENT - 2 (Adjustment of Y/C signal)

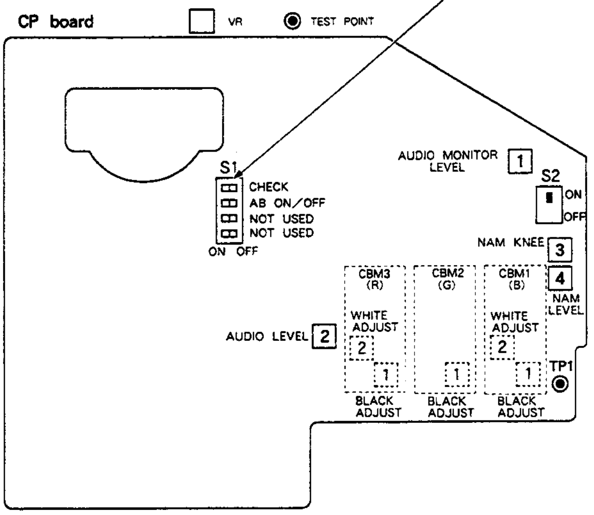
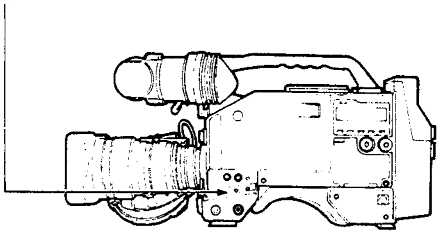
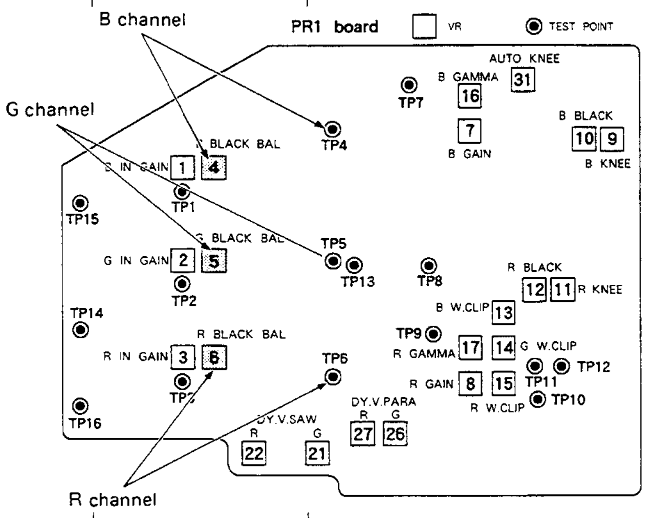
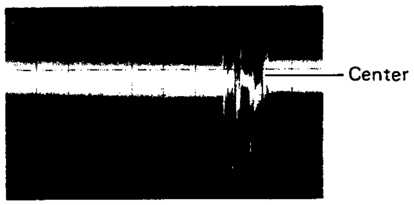
- Perform this adjustment succeeding to the previous section 'Encoder Adjustment - 1'.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⏀) Adjustment level (☆)	Adjustment procedure
1	Y/C signal level	Oscilloscope (H-rate, 10 : 1)	◎ TP6 [SECC] ⏀ VTR Y [SECC] (VR7) ☆ SYNC level: 0.18 Vp-p	1) Adjust VRs to obtain respectively specified levels. 
			◎ TP7 [SECC] ⏀ VTR C [SECC] (VR11) ☆ BURST level: 0.3 Vp-p	


SECC board
VR
TEST POINT
TP11
SC ERR
1
G GAIN
CBM1
V.LEVEL 3
TP1
CC G
H.LEVEL 1
5
SC LOCK
TP2
CC
SYNC LEVEL
8
TP10
H ERR
V.BAL 2
NOISE SLICE
2
VC2
H ADJ
R - Y GAIN
BURST LEVEL
TP6 Y
9
17
TP7
C
VTR C
11
7
VTR Y
CBM2
C MASTER 10
TP9
SYNC
QUAD 12
13
B - Y C.BAL
TP8
COMPO
1
ZEBRA SET
VC1
SC ADJ
X1
SC TRANS
TP3
SC
TP5 HD
R - Y C.BAL 15
COMP GAIN
TP4 VD
TP13 TEST
6
TP12 GND

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⌽) Adjustment level (☆)	Adjustment procedure

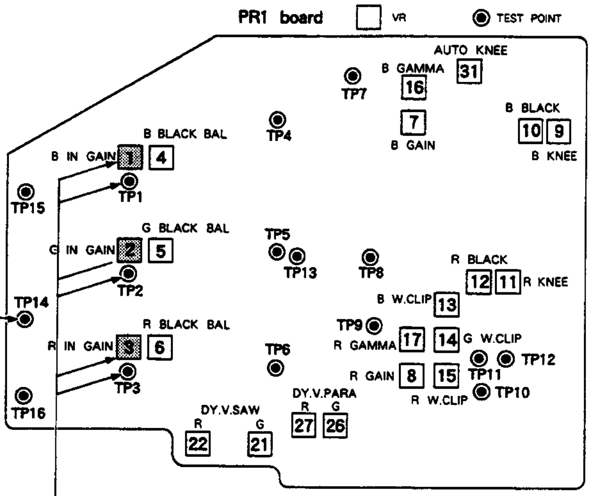
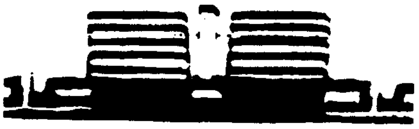
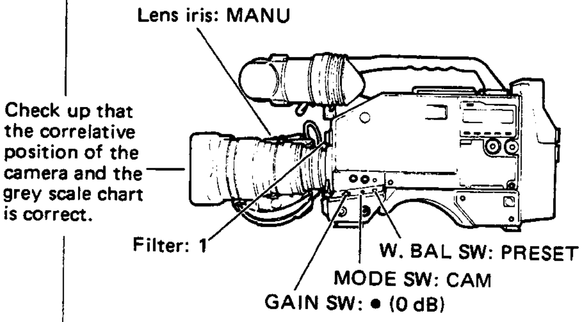
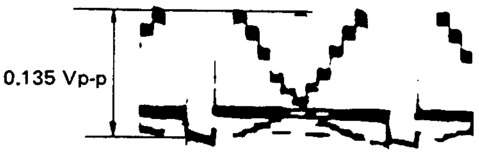
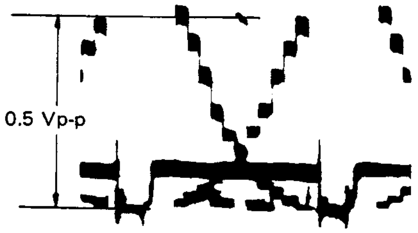
3.6 BLACK BALANCE ADJUSTMENT

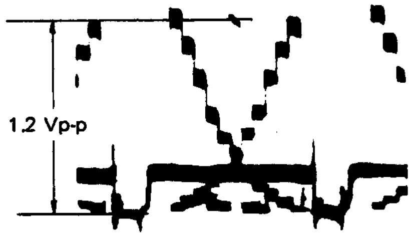
1	Preparation			1) Turn on S1-CHECK of the CP board. (Although the adjustment menu is displayed in the viewfinder, it is not used for this section but for section 3.8 and after.) 2) Close the lens with the cap. 3) Set the MODE switch to CAM. 
2	Black balance	Oscilloscope (H-rate, 10 : 1) (DC range)	• B channel ◎ TP4 [PR1] ⌽ B. BLACK BAL [PR1] (VR4) • G channel ◎ TP5 [PR1] ⌽ G. BLACK BAL [PR1] (VR5) • R channel ◎ TP6 [PR1] ⌽ R. BLACK BAL [PR1] (VR6) 	1) Switch the GAIN control between • (0 dB) and ••• (18 dB) repeatedly and set it to the position where the center of noise does not fluctuate in a straight line.  DC range **For reference:** When the menu is set to ADJUST MENU, combination of the GAIN switch and the sensitivity is automatically set to 0 dB/ 9 dB/18 dB. • Proceed to 3.7 'Adjustment of In-Gain' in succession.

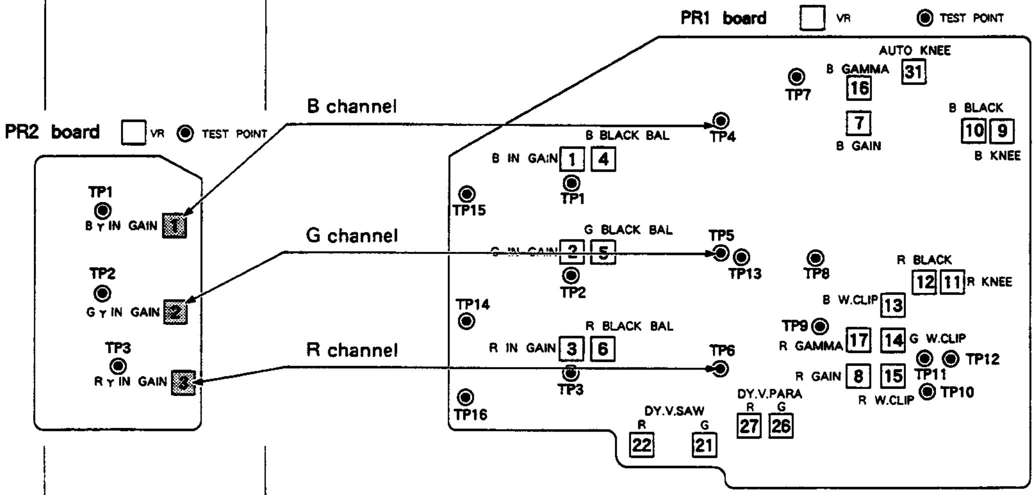
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⦶) Adjustment level (☆)	Adjustment procedure

3.7 IN-GAIN ADJUSTMENT (Setting of input signal)

- This adjustment must be performed following the section 3.6 'Black Balance Adjustment'.

1	Preparation	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1)	 PR1 board VR TEST POINT AUTO KNEE B GAMMA 31 16 TP7 7 B GAIN B BLACK 10 9 B KNEE B BLACK BAL TP4 B IN GAIN 1 4 TP1 TP15 G BLACK BAL TP5 G IN GAIN 2 5 TP13 TP8 R BLACK 12 11 R KNEE TP2 B W.CLIP 13 TP14 R BLACK BAL TP9 R GAMMA 17 14 G W.CLIP R IN GAIN 3 6 TP6 TP12 TP3 R GAIN 8 15 TP11 DY.V.PARA R G R W.CLIP TP10 TP16 DY.V.SAW R G 27 26 22 21 ◎ TP14 [PR1] ⦶ Lens iris ☆ 0.135 Vp-p	**● Lighting condition** ● Sufficient lighting so that the iris is set to F5.6 or small stop with 100% incoming signal. ● Even illumination on the test pattern. **How to confirm lighting condition:** Connect an oscilloscope to TP1 (B CH) of the PR board and adjust lighting by observing the oscilloscope at V-rate so that the video signal waveform is flat.  1) Set the camera as illustrated below.  Lens iris: MANU Check up that the correlative position of the camera and the grey scale chart is correct. Filter: 1 W. BAL SW: PRESET MODE SW: CAM GAIN SW: ● (0 dB) 2) Adjust the lens iris to obtain the specified level (with 100% signal).  **Note:** Leave the lens iris as it is set until setting of B and R gains are completed.
2	In-gain adjustment No. 1		B channel ◎ TP1 [PR1] ⦶ B IN GAIN [PR1] (VR1) ☆ 0.5 Vp-p G channel ◎ TP2 [PR1] ⦶ G IN GAIN [PR1] (VR2) ☆ 0.5 Vp-p R channel ◎ TP3 [PR1] ⦶ B IN GAIN [PR1] (VR3) ☆ 0.5 Vp-p	1) Adjust VRs to obtain the specified level at respective test points. 

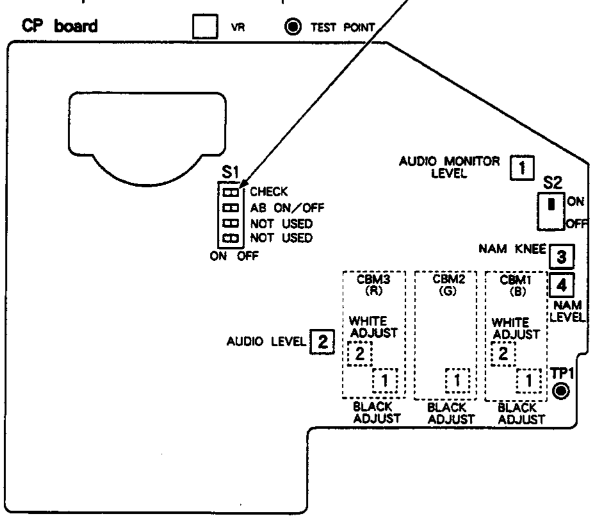
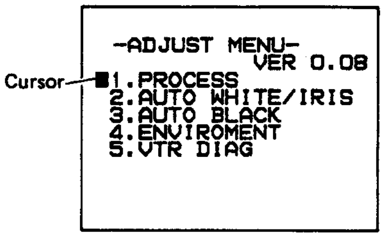
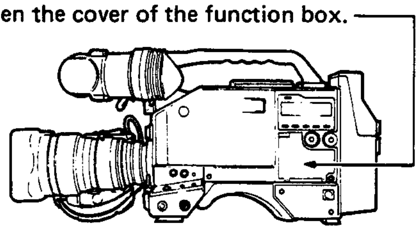
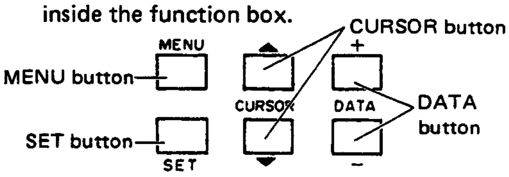
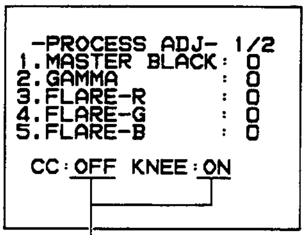
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
3	In-gain adjustment No. 2	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1)	B channel ◎ TP4 [PR1] Ⓣ B GAMMA IN GAIN [PR2] (VR1) ☆ 1.2 Vp-p G channel ◎ TP5 [PR1] Ⓣ G GAMMA IN GAIN [PR2] (VR2) ☆ 1.2 Vp-p R channel ◎ TP6 [PR1] Ⓣ R GAMMA IN GAIN [PR2] (VR3) ☆ 1.2 Vp-p	1) Adjust VRs to obtain the specified level at respective test points.  ● Proceed to 3.8 'Adjustment of video output level and black'.

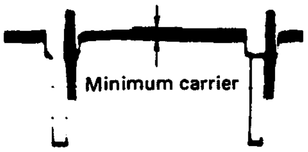

PR2 board
VR
TEST POINT
TP1
B γ IN GAIN
1
TP2
G γ IN GAIN
2
TP3
R γ IN GAIN
3
B channel
G channel
R channel
PR1 board
VR
TEST POINT
AUTO KNEE
31
B GAMMA
16
TP7
7
B GAIN
B BLACK
10
9
B KNEE
B BLACK BAL
TP4
B IN GAIN
1
4
TP1
TP15
G BLACK BAL
G IN GAIN
2
5
TP5
TP13
TP8
TP2
R BLACK
12
11
R KNEE
B W.CLIP
13
TP14
R BLACK BAL
TP9
R IN GAIN
3
6
TP6
R GAMMA
17
14
G W.CLIP
TP12
TP11
TP3
R GAIN
8
15
TP10
R W.CLIP
DY.V.PARA
R
G
27
26
TP16
DY.V.SAW
R
G
22
21

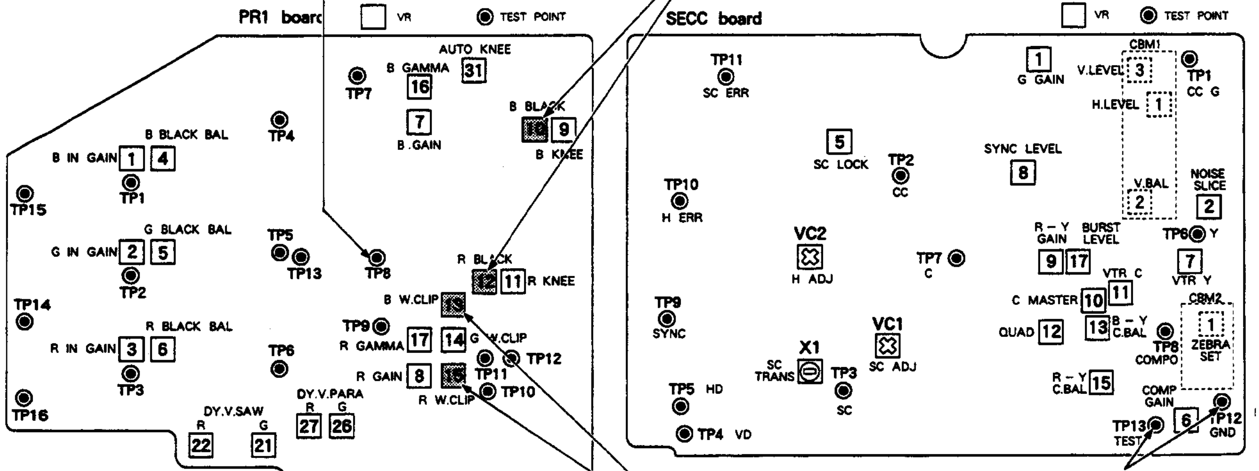
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (ⓣ) Adjustment level (☆)	Adjustment procedure

3.8 ADJUSTMENT OF VIDEO OUTPUT LEVEL AND BLACK

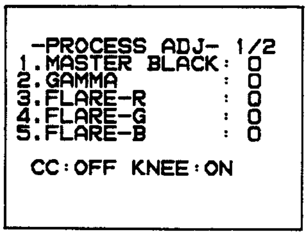
- This adjustment must follow the section 3.7 'In-Gain Adjustment'.

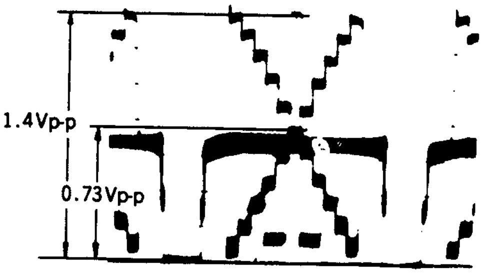
1	Preparation (Display of adjustment menu)		 CP board VR TEST POINT S1 CHECK AB ON/OFF NOT USED NOT USED ON OFF AUDIO MONITOR LEVEL 1 S2 ON OFF NAM KNEE 3 4 NAM LEVEL CBM3 (R) CBM2 (G) CBM1 (B) WHITE ADJUST 2 1 BLACK ADJUST AUDIO LEVEL 2 TP1 For detail of the adjustment menu, see Section 2.10.	1) Confirm that the main menu for adjustment is displayed in the viewfinder. (If not, turn on S1-CHECK of the CP board.)  -ADJUST MENU- VER 0.08 1.PROCESS 2.AUTO WHITE/IRIS 3.AUTO BLACK 4.ENVIROMENT 5.VTR DIAG Main menu for adjustment 2) Open the cover of the function box.  3) For adjustment, use the following buttons inside the function box.  MENU MENU button CURSOR button + CURSOR DATA DATA button SET button SET –
2	Black of R, B channels		**How to use PROCESS ADJ menu:** • Blinking value changes by pressing the DATA button. Press the CURSOR button to shift blinking indication to another. • If you want a help for further operation, press the MENU button several times, and the menu returns to the main menu. In this case, be careful of further operation since values which are erroneously inputted are still effective.	1) Close the lens with the cap. 2) Set the cursor to '1' by the CURSOR button. (on the viewfinder screen) 3) Press the SET button. Then, PROCESS ADJ menu is displayed.  -PROCESS ADJ- 1/2 1.MASTER BLACK: 0 2.GAMMA : 0 3.FLARE-R : 0 4.FLARE-G : 0 5.FLARE-B : 0 CC: OFF KNEE: ON Automatically turned on/off according to adjustment item. 4) Confirm that the numeral of '1. MASTER BLACK' is blinking. 5) Depress the '+' DATA button until the indication value becomes maximum (28).

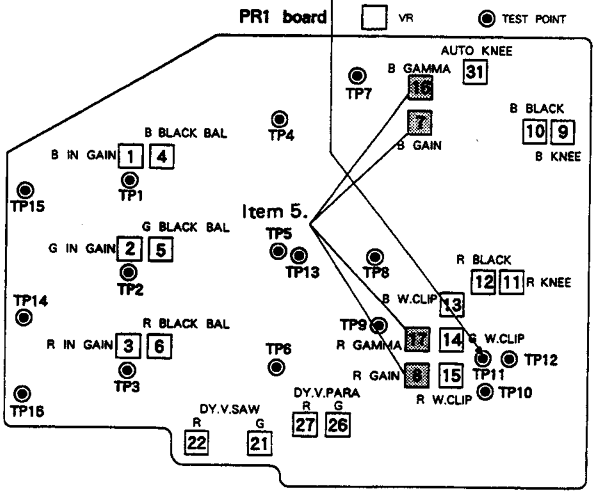
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
		Lens : Capped Oscilloscope (H-rate, 10 : 1)	◎ TP8 [SECC] • For GY-X1, shortcircuit between TP12 and TP13 of the SECC board. Ⓣ B. BLACK [PR1] (VR10) Ⓣ R. BLACK [PR1] (VR12) ☆ Minimum carrier leak	6) Alternately turn VRs to minimize carrier leak.  Minimum carrier
3	Master black		◎ TP8 [PR1] Ⓣ DATA button '–', '+'	7) Set '+' and '–' DATA buttons so that center level of noise become blanking level.

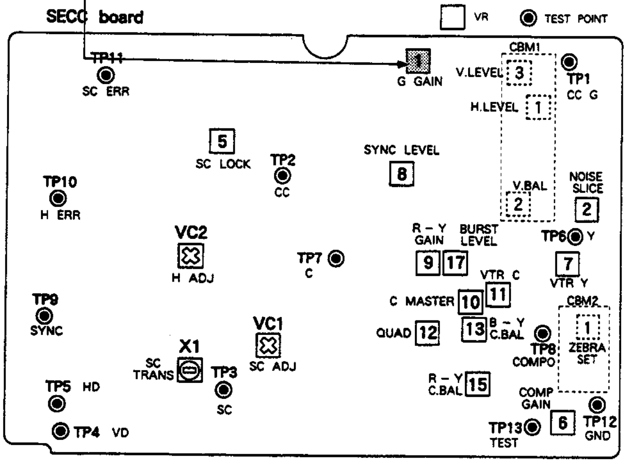

PR1 board
VR
TEST POINT
AUTO KNEE
B GAMMA
31
16
TP7
7
B .GAIN
B BLACK
9
B KNEE
B BLACK BAL
TP4
B IN GAIN
1
4
TP1
TP15
G BLACK BAL
G IN GAIN
2
5
TP2
TP5
TP13
TP8
R BLACK
12
11
R KNEE
B W.CLIP
TP14
R BLACK BAL
R IN GAIN
3
6
TP3
TP6
TP9
R GAMMA
17
14
G W.CLIP
TP12
R GAIN
8
15
TP11
R W.CLIP
TP10
TP16
DY.V.SAW
R
G
22
21
DY.V.PARA
R
G
27
26
SECC board
VR
TEST POINT
TP11
SC ERR
1
G GAIN
CBM1
V.LEVEL
3
H.LEVEL
1
TP1
CC G
5
SC LOCK
TP2
CC
SYNC LEVEL
8
TP10
H ERR
V.BAL
2
NOISE SLICE
2
VC2
H ADJ
TP7
C
R – Y GAIN
BURST LEVEL
9
17
TP6
Y
7
VTR Y
VTR C
11
C MASTER
10
TP9
SYNC
CBM2
1
ZEBRA SET
QUAD
12
13
B – Y C.BAL
TP8
COMPO
VC1
SC ADJ
X1
SC TRANS
TP3
SC
TP5
HD
R – Y C.BAL
15
COMP GAIN
6
TP13
TEST
TP12
GND
TP4
VD

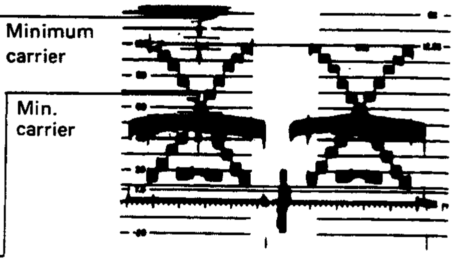
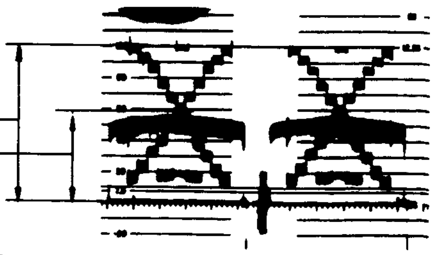
Connect a shunt wire between TP12 and TP13 for GY-X1.

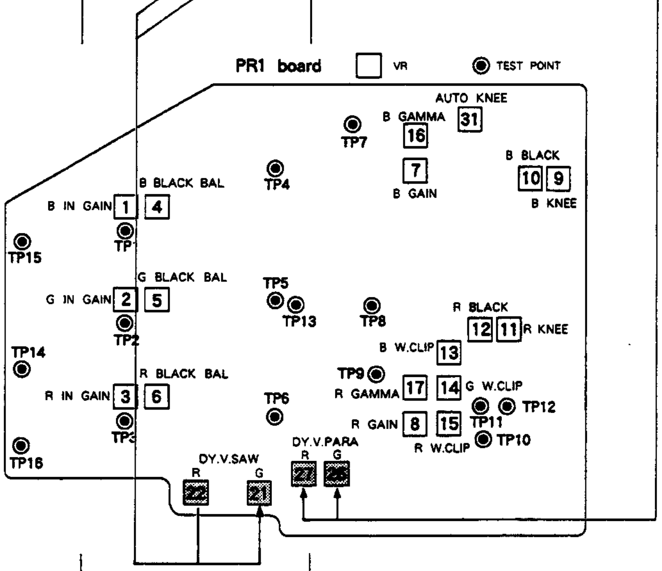
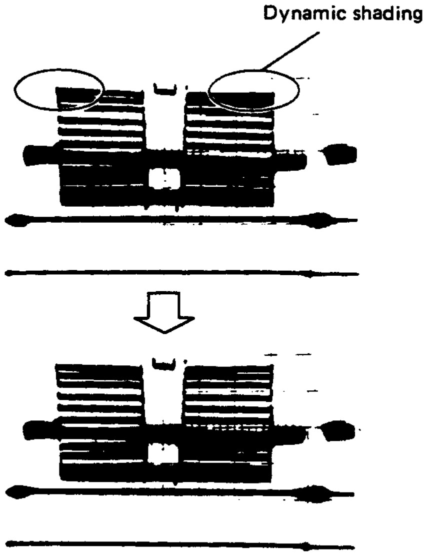
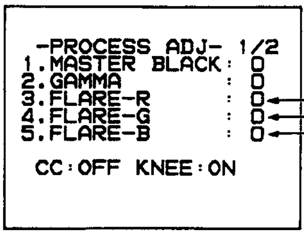
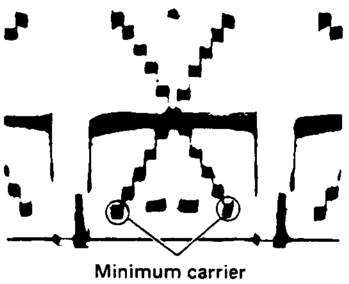
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
4	G channel Gain & Gamma			8) Pick up the gray scale chart. 9) Press ' ▼ ' of the CURSOR button so that numeral of '2. GAMMA' blinks. -PROCESS ADJ- 1/2 1.MASTER BLACK: 0 2.GAMMA : 0 3.FLARE-R : 0 4.FLARE-G : 0 5.FLARE-B : 0 CC:OFF KNEE:ON
		Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1)	◎ TP5 [PR1] Ⓣ Lens iris ☆ 1.2 Vp-p Ⓣ B. W. CLIP [PR1] (VR13) Ⓣ R. W. CLIP [PR1] (VR15) ☆ Full counterclockwise position	10) Confirm the input signal level. If it is not the specified value, adjust the lens iris to obtain the specified value. 11) Release the white clipping.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⏀) Adjustment level (☆)	Adjustment procedure
			• Peak level ◎ TP11 [PR1] ⏀ G. GAIN [SECC] (VR1) ☆ 1.4 Vp-p • Cross point level ◎ TP11 [PR1] ⏀ DATA button '–', '+' ☆ 0.73 Vp-p	12) Adjust peak level and cross point level of G channel as specified. 


PR1 board
VR
TEST POINT
AUTO KNEE
31
B GAMMA
16
TP7
B BLACK
10
9
B KNEE
7
B GAIN
TP4
B BLACK BAL
B IN GAIN
1
4
TP1
TP15
Item 5.
G BLACK BAL
G IN GAIN
2
5
TP2
TP5
TP13
TP8
R BLACK
12
11
R KNEE
TP14
B W.CLIP
13
R BLACK BAL
R IN GAIN
3
6
TP3
TP6
TP9
R GAMMA
17
14
G W.CLIP
TP12
R GAIN
8
15
TP11
R W.CLIP
TP10
TP16
DY.V.SAW
R
G
22
21
DY.V.PARA
R
G
27
26


SECC board
VR
TEST POINT
TP11
SC ERR
1
G GAIN
CBM1
V.LEVEL
3
H.LEVEL
1
TP1
CC G
5
SC LOCK
TP2
CC
SYNC LEVEL
8
TP10
H ERR
V.BAL
2
NOISE SLICE
2
VC2
H ADJ
TP7
C
R-Y GAIN
9
BURST LEVEL
17
TP6
Y
7
VTR Y
VTR C
TP9
SYNC
C MASTER
10
11
CBM2
1
VC1
SC ADJ
X1
SC TRANS
TP3
SC
QUAD
12
13
B-Y C.BAL
TP8
COMPO
ZEBRA SET
TP5
HD
R-Y C.BAL
15
COMP GAIN
TP12
GND
TP4
VD
TP13
TEST
6

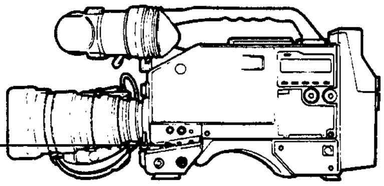
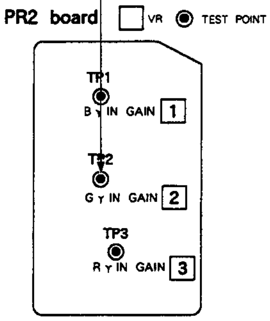
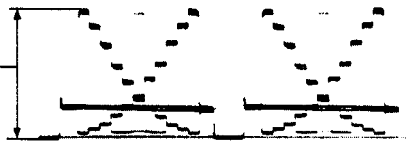
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⏀) Adjustment level (☆)	Adjustment procedure
5	R, B channel Gain and Gamma	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1) or Waveform monitor (H-rate)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. ⏀ B. OUT GAIN [PR1] (VR7) ⏀ R. OUT GAIN [PR1] (VR8) ☆ Minimum carrier leak in peak level. ⏀ B. GAMMA [PR1] (VR16) ⏀ R. GAMMA [PR1] (VR17) ☆ Minimum carrier leak at cross point. **Specified value:** ☆ 100 % (0.7 Vp-p) ☆ 54 % (0.38 Vp-p)	13) Minimize white level of video signal and carrier at the cross point.  • Confirm that signal level at the VIDEO OUTPUT is as specified with minimum carrier leak. • If the level is not correct, slightly turn G GAIN VR of the SECC board or press the DATA button ('–' or '+') several times, and again turn the B. GAIN and R. GAIN or B. GAMMA and R. GAMMA controls respectively to minimize carrier. 

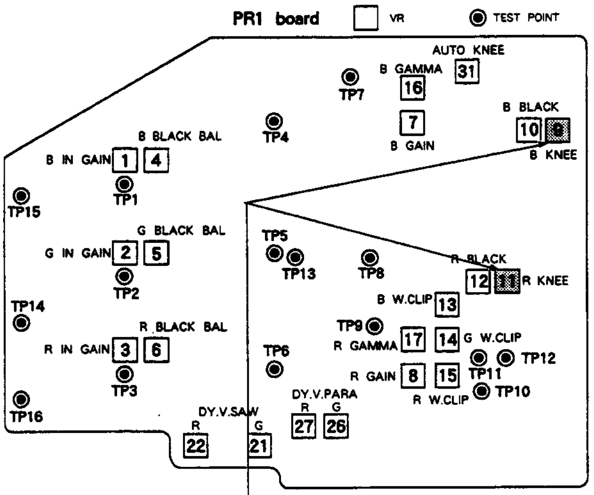
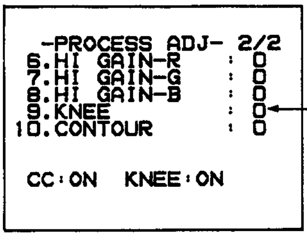
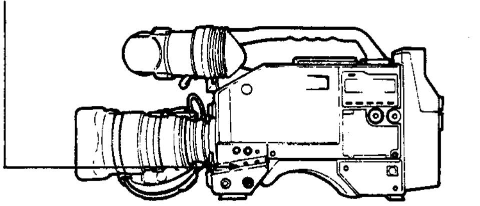
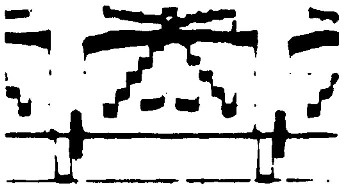
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
6	V. dynamic shading	Oscilloscope (V-rate) or Waveform monitor (2 V) Gray scale chart Just scan	◎ Same as the previous item 5. Ⓣ [PR1] G-DY V. SAW (VR21) R-DY V. SAW (VR22) G-DY R. PARA (VR26) R-DY V. PARA (VR27) ☆ Minimum dynamic shading  PR1 board VR TEST POINT AUTO KNEE 31 B GAMMA 16 TP7 B BLACK 10 9 B KNEE 7 B GAIN TP4 B BLACK BAL B IN GAIN 1 4 TP1 TP15 G BLACK BAL G IN GAIN 2 5 TP2 TP5 TP13 TP8 R BLACK 12 11 R KNEE B W.CLIP 13 TP14 R BLACK BAL R IN GAIN 3 6 TP3 TP9 R GAMMA 17 14 G W.CLIP TP12 TP11 TP6 R GAIN 8 15 R W.CLIP TP10 TP16 DY.V.SAW R G 22 21 DY.V.PARA R G 27 26	• When dynamic shading (carrier leak) is observed in the white level of video signal, perform the following adjustment with the lens iris set to F5.6 or smaller stop. 14) Minimize dynamic shading.  Dynamic shading
7	Flare correction	Oscilloscope (H-rate, 10 : 1) or Waveform monitor (H-rate) Gray scale chart ↓ Just scan	◎ Same as the previous item 5. Ⓣ DATA and CURSOR buttons ☆ Minimum carrier in black section (Level of black section to be 15 IRE.)  -PROCESS ADJ- 1/2 1.MASTER BLACK : 0 2.GAMMA : 0 3.FLARE-R : 0 4.FLARE-G : 0 5.FLARE-B : 0 CC : OFF KNEE : ON	15) Change the values '8. FLARE-R', '4. FLARE-G' and '5. FLARE-B' alternately to minimize carrier leak in the black section. • Shift the blinking item to another by pressing the CURSOR button. • Change the blinking value by the DATA button. 16) Confirm that level of the black section is 15 IRE. If not, slightly change the value of '4. FLARE-G', then repeat item 15).  Minimum carrier • Proceed to Section 3.9 'Adjustment of 18 dB tracking, knee slope and white clip'.

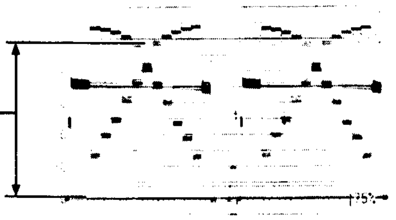
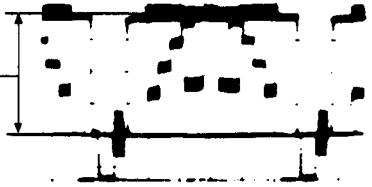
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

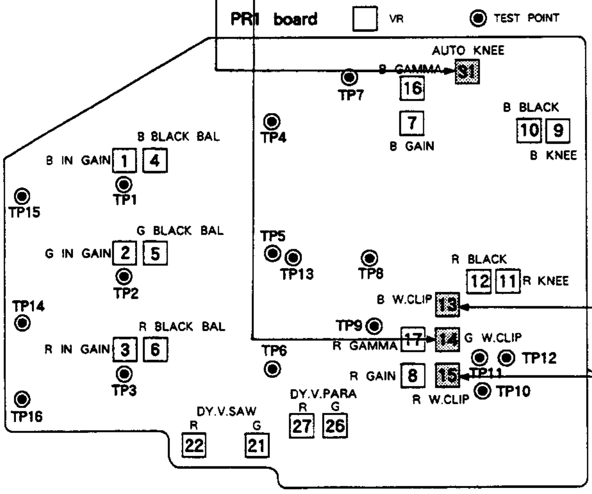
3.9 ADJUSTMENT OF 18 dB TRACKING, KNEE SLOPE AND WHITE CLIP

- This adjustment must follow the Section 3.8 'Adjustment of Video Output Level and Black'.

1	18 dB tracking			• Set the lens iris to MANU. • Confirm the PROCESS ADJ menu being displayed in the viewfinder. -PROCESS ADJ- 1/2 1.MASTER BLACK: 0 2.GAMMA : 0 3.FLARE-R : 0 4.FLARE-G : 0 5.FLARE-B : 0 CC:OFF KNEE:ON
		Gray scale chart ↓ Just scan Waveform monitor or Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.7 Vp-p (white level of gray scale chart)	1) Check input signal level , and if it is not the specified value, adjust the lens iris to obtain it. 2) Press '▼' or '▲' of the CURSOR button to display the page 2/2 of the PROCESS menu. -PROCESS ADJ- 2/2 6.HI GAIN-R : 0 7.HI GAIN-G : 0 8.HI GAIN-B : 0 9.KNEE : 0 10.CONTOUR : 0 CC:ON KNEE:ON
			For reference: When the menu is set to ADJUST MENU, combination of the GAIN switch and the sensitivity is automatically set to 0 dB/9 dB/18 dB.	3) Press the CURSOR button repeatedly until the numeral of '7. HI GAIN-G' blinks. 4) Set the GAIN switch to '••• (18 dB)'. 
		 PR2 board VR TEST POINT TP1 B Y IN GAIN 1 TP2 G Y IN GAIN 2 TP3 R Y IN GAIN 3	◎ TP2 [PR2] or Q17-emitter [PR2] Ⓣ DATA button ('+' or '–') ☆ 3.5 Vp-p	5) Press the DATA buttons ('+' or '–') to obtain the specified video level. 
			◎ TP2 [PR2] or Q17-emitter [PR2] Ⓣ Lens iris ☆ 0.5 Vp-p -PROCESS ADJ- 2/2 6.HI GAIN-R : 0 7.HI GAIN-G : 0 8.HI GAIN-B : 0 9.KNEE : 0 10.CONTOUR : 0 CC:ON KNEE:ON	6) Close the lens iris to set the white level of waveform to 0.5 Vp-p approx. 7) Change values of '6. HI GAIN-R' and '8. HI GAIN-B' to minimize carrier leak of the white level. • Shift the blinking item to another by the CURSOR button. • Change blinking value by the DATA button.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
2	Knee slope	Gray scale chart ↓ Just scan Waveform monitor or Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.7 Vp-p (white level of gray scale chart)  PR1 board VR TEST POINT AUTO KNEE B GAMMA 31 16 TP7 7 B GAIN B BLACK 10 9 B KNEE TP4 B BLACK BAL B IN GAIN 1 4 TP1 TP15 G BLACK BAL G IN GAIN 2 5 TP2 TP14 R BLACK BAL R IN GAIN 3 6 TP3 TP16 TP5 TP13 TP8 R BLACK 12 11 R KNEE B W.CLIP 13 TP9 R GAMMA 17 14 G W.CLIP TP12 TP11 TP6 R GAIN 8 15 TP10 R W.CLIP DY.V.PARA R G 27 26 DY.V.SAW R G 22 21 **For reference:** When the menu is set to ADJUST MENU, combination of the GAIN switch and the sensitivity is automatically set to 0 dB/9 dB/18 dB. Ⓣ B. KNEE [PR1] (VR9) Ⓣ R. KNEE [PR1] (VR11) ☆ Minimum carrier leak	1) Set the GAIN switch to '• (0 dBs)'. 2) Check input signal level, and if it is not the specified value, adjust the lens iris to obtain it. 3) Press the CURSOR button repeatedly until the numeral of '9. KNEE' blinks.  -PROCESS ADJ- 2/2 6.HI GAIN-R : 0 7.HI GAIN-G : 0 8.HI GAIN-B : 0 9.KNEE : 0 10.CONTOUR : 0 CC:ON KNEE:ON 4) Press the DATA button ('+' or '–') just before beginning of carrier leak of white level. 5) Set the GAIN switch to '•• (9 dB)'.  6) Alternately turn VRs to minimize carrier leak. 
3	Auto knee	Gray scale chart ↓ Just scan Waveform monitor or Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.7 Vp-p (white level of gray scale chart)	1) Turn off S1-CHECK of the CP board, and confirm that the viewfinder screen is returned to the normal mode. 2) Confirm the AUTO KNEE condition on the "STATUS DISPLAY". (Refer to the instruction manual, page 31.) • If AUTO KNEE is OFF, turn the AUTO KNEE to ON referring to 'Video Signal Setting' described on page 38 of the instruction book. 3) Check input signal level, and if it is not the specified value, adjust the lens iris to obtain it. 4) Open the lens iris 1-stop to obtain 200% incoming signal. 5) Adjust the knee point to the specified value.

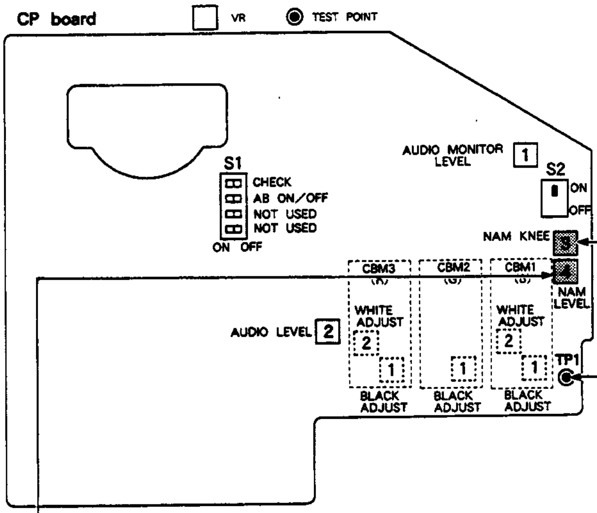
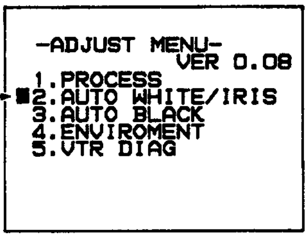
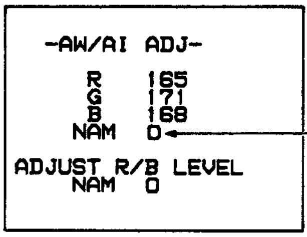
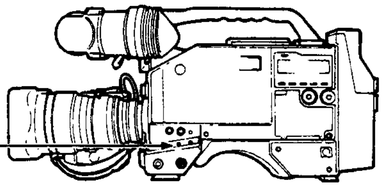
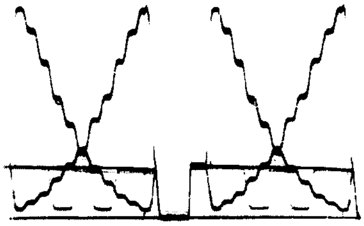
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
			◎ AUTO KNEE [PR1] (VR31) ☆ 95 % (0.665 Vp-p approx.)	 6) Turn the AUTO KNEE to the status which is confirmed in the step 2) according to 'Setting a video signal' described on page 38 of the instruction book. 7) Turn on S1-CHECK of the CP board to display the adjustment menu on the viewfinder screen.
4	White clip		◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.7 Vp-p (white level of gray scale chart) Ⓣ G. W. CLIP [PR2] (VR14) ☆ Lower carrier leak: 0.77 Vp-p (110 %) Ⓣ B. W. CLIP [PR1] (VR13) Ⓣ R. W. CLIP [PR1] (VR15) ☆ Minimum carrier leak	1) Check input signal level, and if it is not the specified value, adjust the lens iris to obtain it. 2) Set the GAIN switch to '••• (18 dB)'. 3) Adjust lower carrier leak to be of 0.77 Vp-p (110 %).  4) Turn VR13 and VR15 alternately to minimize carrier leaks respectively. **Check up the following:** • Repeat the steps 3) and 4) until clipping level becames 0.77 Vp-p (110 %). 5) Set the GAIN switch to '• (0 dB)'. • Proceed to Section 3.10 'Adjustment of Auto Circuit'.


PR1 board
VR
TEST POINT
AUTO KNEE
B GAMMA
31
TP7
16
B BLACK
10
9
B KNEE
TP4
7
B GAIN
B BLACK BAL
B IN GAIN
1
4
TP1
TP15
G BLACK BAL
G IN GAIN
2
5
TP2
TP14
TP5
TP13
TP8
R BLACK
12
11
R KNEE
B W.CLIP
13
TP9
R GAMMA
17
14
G W.CLIP
TP12
R BLACK BAL
R IN GAIN
3
6
TP3
TP6
R GAIN
8
15
TP11
R W.CLIP
TP10
TP16
DY.V.SAW
R
G
22
21
DY.V.PARA
R
G
27
26

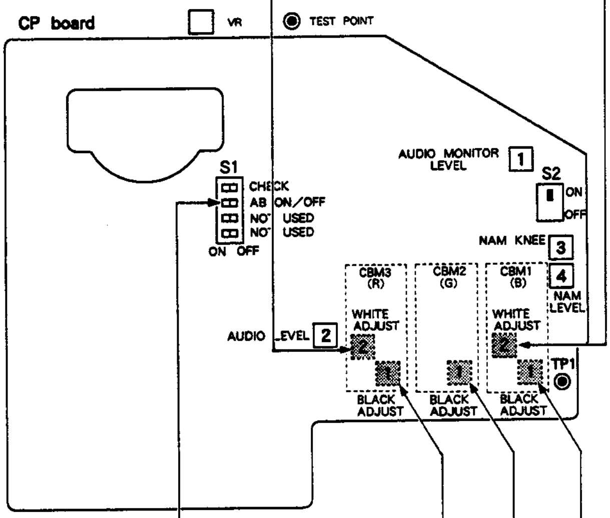
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

3.10 AUTO CIRCUIT (Adjustment of auto iris, auto white and auto black controls)

- Proceed to the following adjustment after completion of all the adjustments of Sections 3.8 and 3.9.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
1	Auto iris  CP board VR TEST POINT S1 CHECK AB ON/OFF NOT USED NOT USED ON OFF AUDIO MONITOR LEVEL 1 S2 ON OFF NAM KNEE 3 CBM3 (R) CBM2 (G) CBM1 (B) 4 NAM LEVEL WHITE ADJUST 2 WHITE ADJUST 2 AUDIO LEVEL 2 1 1 1 TP1 BLACK ADJUST BLACK ADJUST BLACK ADJUST	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1) or Waveform monitor (H-rate)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.7 Vp-p (white level of gray scale chart) ◎ TP1 [CP] Ⓣ NAM KNEE [CP] (VR3) ◎ Vewfinder screen Ⓣ NAM LEVEL [CP] (VR4)	• Lens iris set to MANUAL. • Display the main menu for adjustment in the viewfinder. (Refer to Sect. 3.8, Item 1.)  -ADJUST MENU- VER 0.08 1.PROCESS ■2.AUTO WHITE/IRIS 3.AUTO BLACK 4.ENVIROMENT 5.VTR DIAG 1) Press ' ▼ ' of the CURSOR button to shift the cursor to the item No. 2. 2) Press the SET button. The AW/AI ADJ menu is displayed.  -AW/AI ADJ- R 165 G 171 B 168 NAM 0 ADJUST R/B LEVEL NAM 0 3) Check the input signal level. If it is not the specified value, adjust the lens iris to obtain it. 4) Set the GAIN switch to '• (0 dB)'.  5) Set VR3 to the point just before starting knee slope.  6) Adjust VR4 so that the NAM value is '0'.

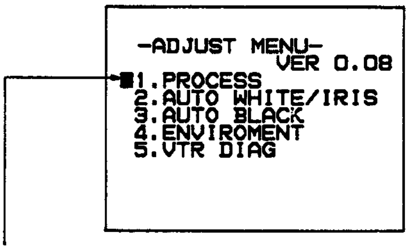
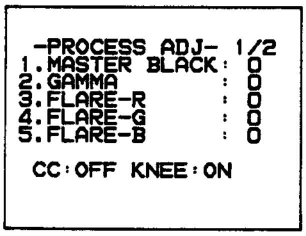
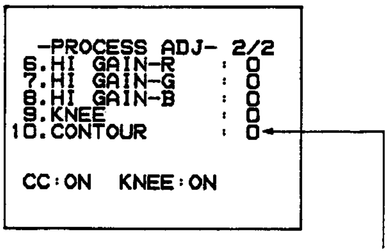
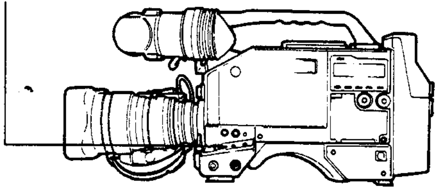
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
2	Auto white		• R channel Ⓣ WHITE ADJUST [CBM3] (VR2) • B channel Ⓣ WHITE ADJUST [CBM1] (VR2)	7) Set the GAIN switch to '• (0 dB)'. 8) Adjust VRs so that values of R channel and B channel become equal to that of G channel respectively on the AW/AI ADJ display. -AW/AI ADJ- R 165 ← Value of R channel G 171 ← Value of G channel (Reference value) B 168 ← Value of B channel NAM 0 ADJUST R/B LEVEL NAM 0 9) Press the MENU button. The main menu for adjustment is displayed. -ADJUST MENU- VER 0.08 1.PROCESS 2.AUTO WHITE/IRIS ■3.AUTO BLACK 4.ENVIROMENT 5.VTR DIAG
3	Auto black		Ⓣ BLACK ADJUST [CBM1, 2, 3] (VR1)	10) Close the lens with the cap. 11) Press ' ▼ ' of the CURSOR button to shift the cursor to the item 3. 12) Set the S1-AB ON/OFF to ON. 13) Press the SET button. The display changes into the AB ADJ. -AB ADJ- R 80 G 95 B 94 ADJUST R/G/B LEVEL 128 14) Adjust VRs so that values of R, G and B become '128' respectively on the AB ADJ display. 15) Turn off the S1-CHECK and S1-AB ON/OFF of the CP board, and confirm that the viewfinder screen is returned to the normal mode.

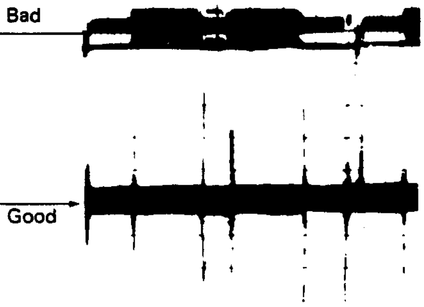
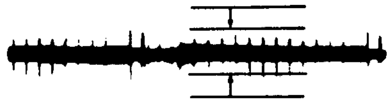

CP board
VR
TEST POINT
AUDIO MONITOR LEVEL 1
S2
ON
OFF
S1
CHECK
AB ON/OFF
NOT USED
NOT USED
ON OFF
NAM KNEE 3
CBM3 (R)
CBM2 (G)
CBM1 (B)
4
NAM LEVEL
WHITE ADJUST
WHITE ADJUST
AUDIO LEVEL 2
TP1
BLACK ADJUST
BLACK ADJUST
BLACK ADJUST

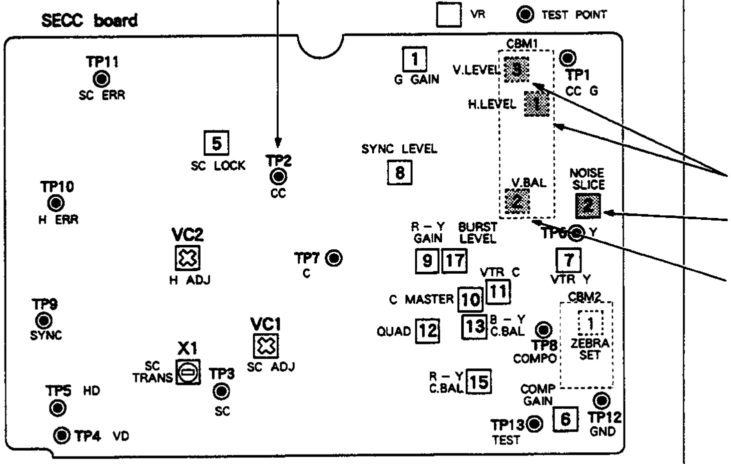
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⌽) Adjustment level (☆)	Adjustment procedure

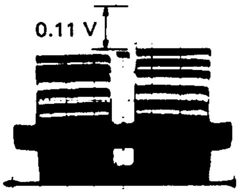
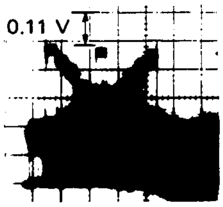
3.11 ADJUSTMENT OF CONTOUR CORRECTOR

- Proceed to this adjustment after all items of Sections 3.8 and 3.9 have been completely adjusted.

1	Preparation	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1) or Waveform monitor (H-rate)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. ⌽ Lens iris ☆ 0.7 Vp-p (White level of gray scale chart)	• Lens iris set to MANUAL. • Display the main menu for adjustment in the viewfinder. (Refer to Sect. 3.8, Item 1.)  -ADJUST MENU- VER 0.08 ■1.PROCESS 2.AUTO WHITE/IRIS 3.AUTO BLACK 4.ENVIROMENT 5.VTR DIAG 1) Set the cursor to the Item 1 by the CURSOR button. 2) Press the SET button. The PROCESS ADJ menu is displayed.  -PROCESS ADJ- 1/2 1.MASTER BLACK: 0 2.GAMMA : 0 3.FLARE-R : 0 4.FLARE-G : 0 5.FLARE-B : 0 CC:OFF KNEE:ON 3) Press '▲' of the CURSOR button to display the page 2/2 of the PROCESS ADJ menu.  -PROCESS ADJ- 2/2 6.HI GAIN-R : 0 7.HI GAIN-G : 0 8.HI GAIN-B : 0 9.KNEE : 0 10.CONTOUR : 0 CC:ON KNEE:ON 4) Confirm that the value of '10. CONTOUR' blinking. When it is not blinking, press '▼' or '▲' of the CURSOR button to blink it. 5) Confirm that the value of '10. CONTOUR' is '0' (zero). If not, press '–' or '+' DATA button to set it to '0'. 6) Set the GAIN switch to '• (0 dB)'.  7) Check the input signal level. If it is not as specified, adjust the lens iris to obtain the correct level.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⦶) Adjustment level (☆)	Adjustment procedure
2	V. zero balance	Oscilloscope (V-rate, 10 : 1) Gray scale chart ↓ Just scan	⦶ H. LEVEL [CBM1] (VR1) ⦶ V. LEVEL [CBM1] (VR3) ☆ Full clockwise position ◎ TP2 [SECC] ⦶ V. BAL [CBM1] (VR2) ☆ Minimum video component	8) Turn VR1 and VR3 of the CBM1 board fully clockwise. 9) Minimize video component.  Bad Good
3	Noise slice	Oscilloscope (H-rate, 10 : 1)	◎ TP2 [SECC] ⦶ NOISE SLICE [SECC] (VR2) ☆ Half noise level	10) Turn VR2 fully clockwise and check noise level. 11) Again turn VR2 to reduce the noise level half as much as that of the above step 10). 

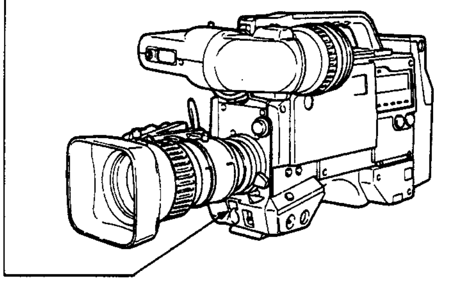

SECC board
VR
TEST POINT
TP11
SC ERR
TP10
H ERR
TP9
SYNC
TP5 HD
TP4 VD
5
SC LOCK
TP2
CC
VC2
H ADJ
TP7
C
X1
SC TRANS
TP3
SC
VC1
SC ADJ
1
G GAIN
SYNC LEVEL
8
CBM1
V.LEVEL 3
H.LEVEL 1
V.BAL 2
TP1
CC G
NOISE SLICE 2
TP6 Y
R – Y GAIN
BURST LEVEL
9
17
VTR C
11
7
VTR Y
C MASTER 10
QUAD 12
13 B – Y C.BAL
TP8 COMPO
CBM2
1
ZEBRA SET
R – Y C.BAL 15
COMP GAIN
TP13 TEST
6
TP12 GND
Items 2, 4
Item 3
Item 2

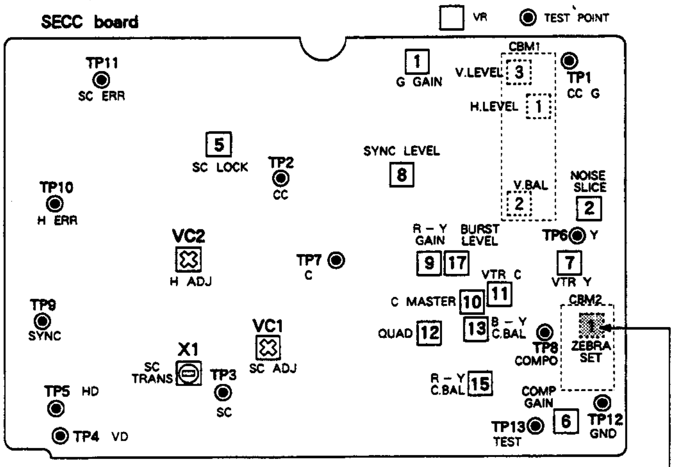
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⦶) Adjustment level (☆)	Adjustment procedure
4	Contour level	Gray scale chart ↓ Just scan Oscilloscope (V-rate, 10 : 1) (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. ⦶ Lens iris ☆ 0.56 Vp-p (80 %) ⦶ V. LEVEL [CBM1] (VR3) ☆ 0.11 Vp-p (15 %) ⦶ H. LEVEL [CBM1] (VR1) ☆ 0.11 Vp-p (15 %)	12) Set the white level of the gray scale to the specified value. 13) Adjust the contour level as specified.  0.11 V V-Rate  0.11 V H-Rate 14) Turn off the S1-CHECK of the CP board. Confirm that the viewfinder screen returns to the normal mode.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

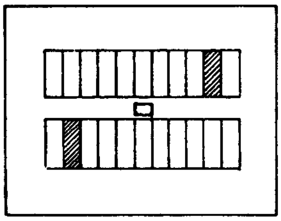
3.12 ADJUSTMENT OF VIDEO LEVEL INDICATOR

- Proceed to this adjustment after all items of the sections 3.8 and 3.9 have been completely adjusted.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
1	Video level indicator	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1) or Waveform monitor (H-rate)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.7 Vp-p (white level of gray scale chart)	• Lens iris set to MANUAL. 1) Pick up the gray scale chart. 2) Check the input signal level. When it is not the specified value, adjust the lens iris to obtain it. 3) Turn on the ZEBRA switch located on the front of the camera. 

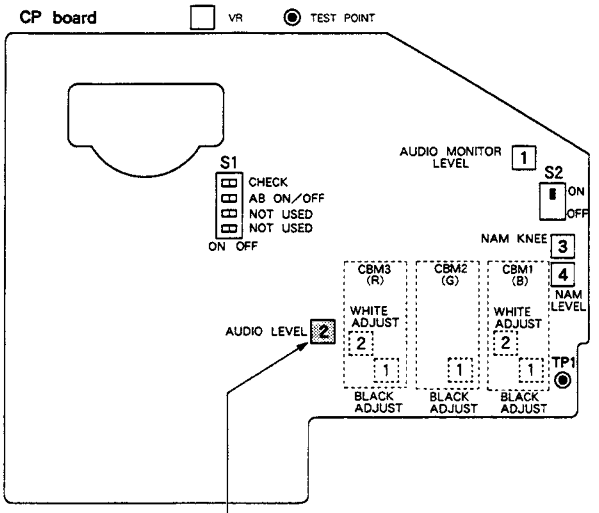
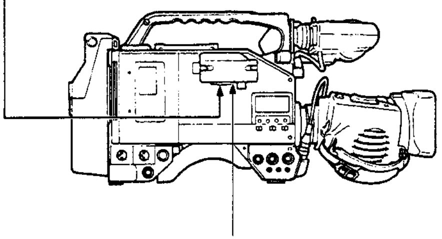
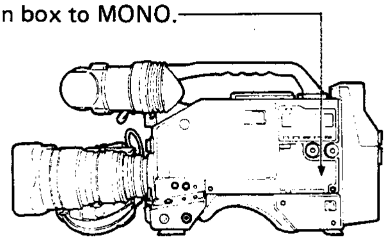
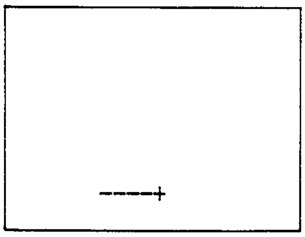


SECC board
VR
TEST POINT
TP11
SC ERR
1
G GAIN
CBM1
V.LEVEL 3
TP1
CC G
H.LEVEL 1
5
SC LOCK
TP2
CC
SYNC LEVEL
8
TP10
H ERR
V.BAL
2
NOISE SLICE
2
VC2
H ADJ
R – Y GAIN
BURST LEVEL
TP6 Y
TP7
C
9 17
VTR C
7
VTR Y
TP9
SYNC
C MASTER 10 11
CBM2
VC1
QUAD 12
13 B – Y C.BAL
TP8
COMPO
ZEBRA SET
X1
SC TRANS
TP3
SC
SC ADJ
R – Y C.BAL 15
COMP GAIN
TP5 HD
TP13 TEST
6
TP12 GND
TP4 VD

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
			◎ Viewfinder screen Ⓣ ZEBRA SET [CBM2] (VR1)	4) Observing the viewfinder, adjust VR1 so that the zebra mark is displayed in the 2nd step from the white. 

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (ⓣ) Adjustment level (☆)	Adjustment procedure

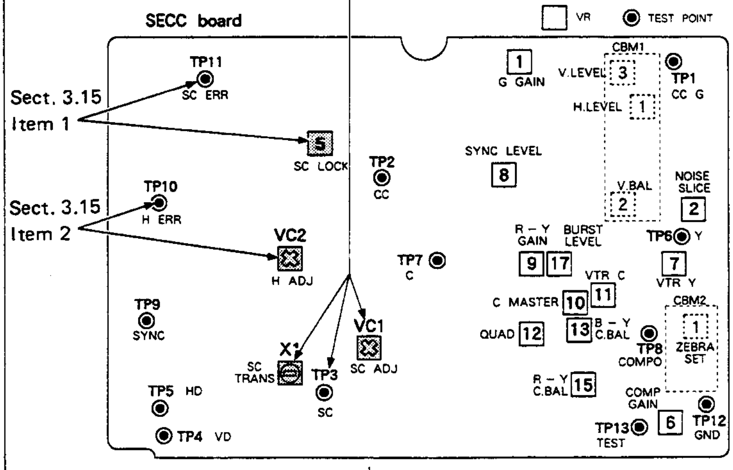
3.13 ADJUSTMENT OF AUDIO LEVEL INDICATOR

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (ⓣ) Adjustment level (☆)	Adjustment procedure
1	Audio level indicator	Oscillator (–60 dB, 1 kHz)	 CP board VR TEST POINT S1 CHECK AB ON/OFF NOT USED NOT USED ON OFF AUDIO MONITOR LEVEL 1 S2 ON OFF NAM KNEE 3 CBM3 (R) CBM2 (G) CBM1 (B) 4 NAM LEVEL WHITE ADJUST 2 AUDIO LEVEL 2 1 BLACK ADJUST BLACK ADJUST BLACK ADJUST TP1 ◎ Viewfinder screen ⓣ AUDIO LEVEL [CP] (VR2)	1) Input a signal from an oscillator to the EXT. MIC connector (XLR 3-pin).  2) Set the MIC INT/EXT switch to EXT. 3) Set the MIC SELECT switch inside the function box to MONO.  4) Adjust VR2 so that audio level is indicated by five illuminations in the viewfinder.  Audio level may not be indicated as a result of setting of the memory function of the camera. In this case, display the level indication referring to the following descriptions of the instruction book. • Status display (page 31) • Memory function (page 32) • Operation mode setting 'Audio level indicator on/off (page 40)

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⏀) Adjustment level (☆)	Adjustment procedure

3.14 ADJUSTMENT OF SSG (Adjustment of internal sync. signal)

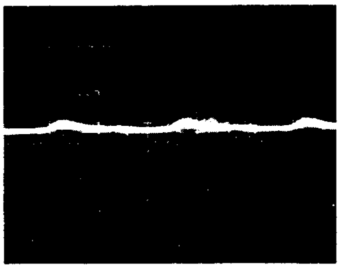
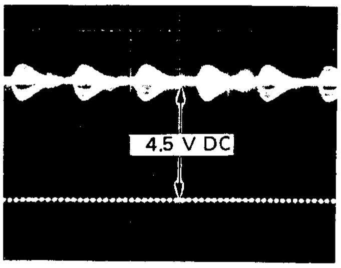
1	SC frequency	Frequency counter Oscilloscope	◎ TP3 [SECC] ⏀ SC ADJ [SECC] (VC1) ☆ 4.43361875 MHz ± 5 Hz ⏀ SC TRANS [SECC] (X1) ☆ Maximum output amplitude	• Close the lens with the cap and warm up the camera for more than 15 minutes. • The capacity of a frequency counter is required as: 1) 8 or more figures readable 2) Stability of 0.1 ppm or 1×10^{-7} at 0°C to 40°C. 1) Set to the specified value. 2) Adjust for the maximum level.



SECC board
VR
TEST POINT
Sect. 3.15 Item 1
Sect. 3.15 Item 2
TP11
SC ERR
5
SC LOCK
TP10
H ERR
VC2
H ADJ
TP9
SYNC
TP5 HD
TP4 VD
X1
SC TRANS
TP3
SC
VC1
SC ADJ
TP2
CC
TP7
C
1
G GAIN
V.LEVEL
3
H.LEVEL
1
CBM1
TP1
CC G
SYNC LEVEL
8
V.BAL
2
NOISE SLICE
2
R – Y GAIN
BURST LEVEL
9
17
TP6 Y
7
VTR C
VTR Y
C MASTER
10
11
CBM2
QUAD
12
13
B – Y C.BAL
TP8 COMPO
1
ZEBRA SET
R – Y C.BAL
15
COMP GAIN
TP13 TEST
6
TP12 GND

3.15 ADJUSTMENT OF SSG (Adjustment of external genlocking) – GY-X1TC only

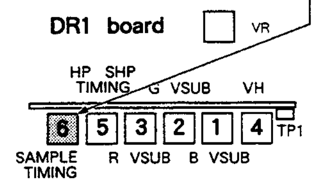
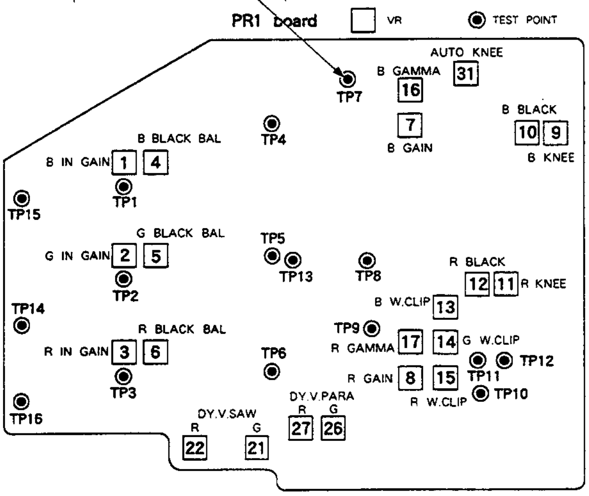
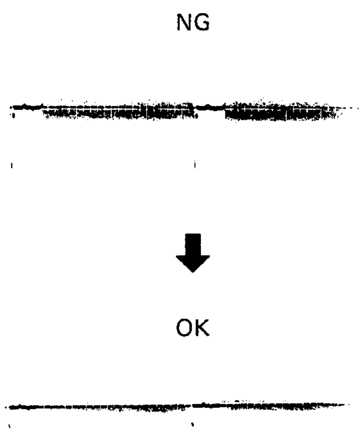
- Input V.B.S. or B.B. signal to the GENLOCK INPUT terminal located on the front left side.
- This adjustment must follow the Section 3.14 'Adjustment of SSG (Adjustment of internal sync. signal).

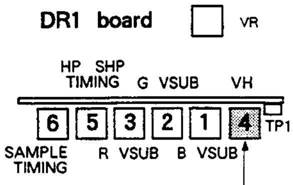
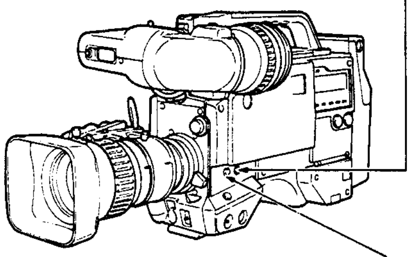
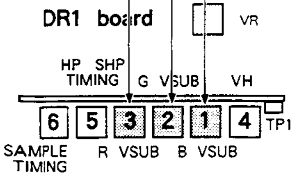
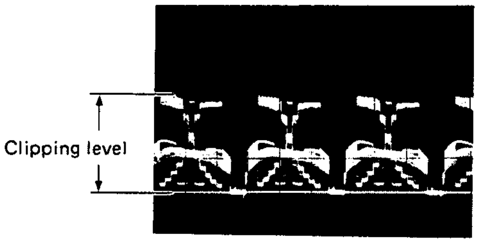
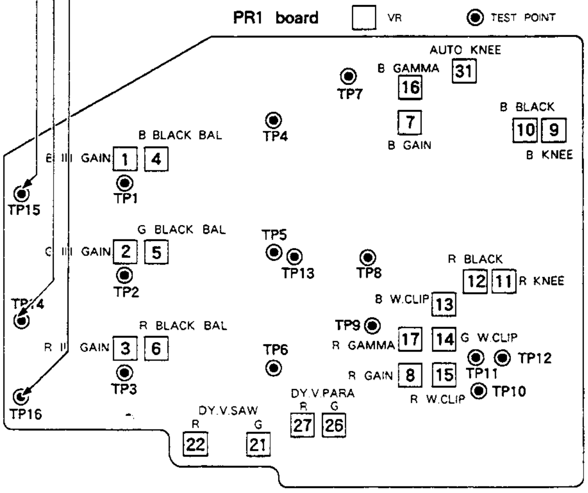
1	SC lock	Oscilloscope (H-rate)	◎ TP11 [SECC] ⏀ SC LOCK [SECC] (VR5) ☆ Minimum jittering	1) Minimize jittering. 
2	H. lock	Oscilloscope (H-rate, DC range)	◎ TP10 [SECC] ⏀ H. ADJ [SECC] (VC2) ☆ Both 4.5 V DC level and jittering at minimum.	2) Adjust levels of 4.5 V DC and jittering to be minimum. 

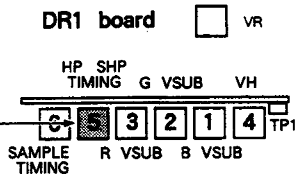
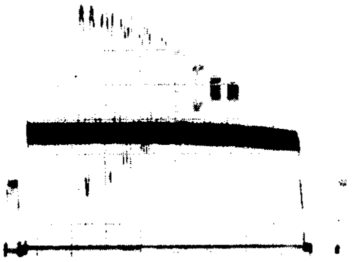
No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (⦶) Adjustment level (☆)	Adjustment procedure

3.16 ADJUSTMENT OF CCD DRIVER

Note:
- This adjustment is not required in general even when the optical block is replaced.
- The following is just a reference for correction off VR setting which is erroneously disturbed.

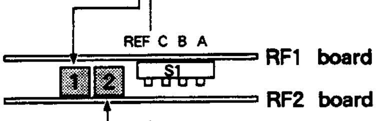
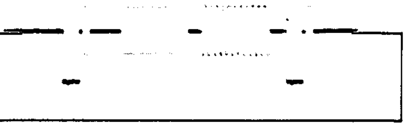
1	Sampling timing	Oscilloscope (H-rate, 10 : 1)	◎ TP7 [PR1] ⦶ SAMPLE TIMING[DR1] (VR6) ☆ Minimum shading  DR1 board VR HP SHP TIMING G VSUB VH 6 5 3 2 1 4 TP1 SAMPLE TIMING R VSUB B VSUB  PR1 board VR TEST POINT AUTO KNEE B GAMMA 31 TP7 16 B BLACK 7 10 9 B GAIN B KNEE B BLACK BAL TP4 B IN GAIN 1 4 TP1 TP15 G BLACK BAL TP5 G IN GAIN 2 5 TP13 TP8 R BLACK TP2 12 11 R KNEE B W.CLIP 13 TP14 R BLACK BAL TP9 R GAMMA 17 14 G W.CLIP R IN GAIN 3 6 TP6 TP12 R GAIN 8 15 TP11 TP3 DY.V.PARA R G R W.CLIP TP10 TP16 DY.V.SAW R G 27 26 22 21	1) Close the lens with the cap. 2) Set the GAIN switch so that the camera sensitivity is 18 dB. 3) Adjust VR6 to minimize shading on B channel. 
			- B channel ◎ TP7 [PR1] - G channel ◎ TP8 [PR1] - R channel ◎ TP9 [PR1]	4) Confirm shading of every channel by changing a test point. 5) When shading is different by channel, adjust VR6 again to make them even. 6) Repeat the above steps 3) through 5) several times.
			◎ VIDEO OUTPUT (with 75 Ω termination) - For GY-X1, see Sect. 3.2.4.	7) Confirm no clock pulse (appearing as vertical stripes) on the color TV monitor. If so, perform fine adjustment with VR6 again by turning it in the direction to reduce it.

No.	Item	Measuring instruments	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
2	VH bias	Digital voltmeter	 DR1 board VR HP SHP TIMING G VSUB VH 6 5 3 2 1 4 TP1 SAMPLE TIMING R VSUB B VSUB ◎ TP1 [DR1] Ⓣ VH [DR1] (VR4) ☆ 17.5 V	1) Press the shutter button (100, 250, 500 and 1000).  2) Adjust voltage as specified. 3) Press the shutter button (NORMAL).
3	V. sub bias (Blooming)  DR1 board VR HP SHP TIMING G VSUB VH 6 5 3 2 1 4 TP1 SAMPLE TIMING R VSUB B VSUB	Gray scale chart ↓ Just scan Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ Lens iris ☆ 0.714 Vp-p (white level of gray scale chart) •B channel ◎ TP15 [PR1] Ⓣ B. VSUB [DR1] (VR1) ☆ 0.31 Vp-p (clipping level) •G channel ◎ TP14 [PR1] Ⓣ G. VSUB [DR1] (VR2) ☆ 0.39 Vp-p (clipping level) •R channel ◎ TP16 [PR1] Ⓣ R. VSUB [DR1] (VR3) ☆ 0.25 Vp-p (clipping level)	• Lens iris set to MANUAL. • Camera sensitivity set to 0 dB. 1) Pick up the gray scale chart. 2) Check the input signal level. When it is not the specified level, adjust the lens iris to obtain the specified value. 3) Open the lens iris. 4) Adjust clipping level of video signal to the specified level.   PR1 board VR TEST POINT AUTO KNEE B GAMMA 31 16 TP7 B BLACK 7 B GAIN 10 9 B KNEE B BLACK BAL TP4 B GAIN 1 4 TP1 TP15 G BLACK BAL G GAIN 2 5 TP2 TP5 TP13 TP8 R BLACK 12 11 R KNEE B W.CLIP 13 TP14 R BLACK BAL TP9 R GAMMA 17 14 G W.CLIP R GAIN 3 6 TP3 TP6 TP12 R GAIN 8 15 TP11 TP16 DY.V.SAW R G 22 21 DY.V.PARA R G 27 26 R W.CLIP TP10

No.	Item	Measuring instruments	**Measuring point (◎)** **Adjustment parts (Ⓣ)** **Adjustment level (☆)**	**Adjustment procedure**
4	Half pitch sampling timing	In-mega chart ↓ Just scan Oscilloscope (H-rate, 10 : 1)	◎ VIDEO OUTPUT (with 75 Ω termination) • For GY-X1, see Sect. 3.2.4. Ⓣ HP SHP TIMING [DR1] (VR5)  DR1 board VR HP SHP TIMING G VSUB VH 6 5 3 2 1 4 TP1 SAMPLE TIMING R VSUB B VSUB	• Lens iris set to AUTO. • Contour correction → OFF 1) Pick up the in-mega chart. 2) Observing frequency response, adjust VR5 to obtain the best result in the high component. 

3.17 ADJUSTMENT OF AEQ REFERENCE SIGNAL

- Adjustment VRs are provided on the RF2 board. The RF2 board can be seen under the top frame by opening the PR1/PR2 boards to this side.

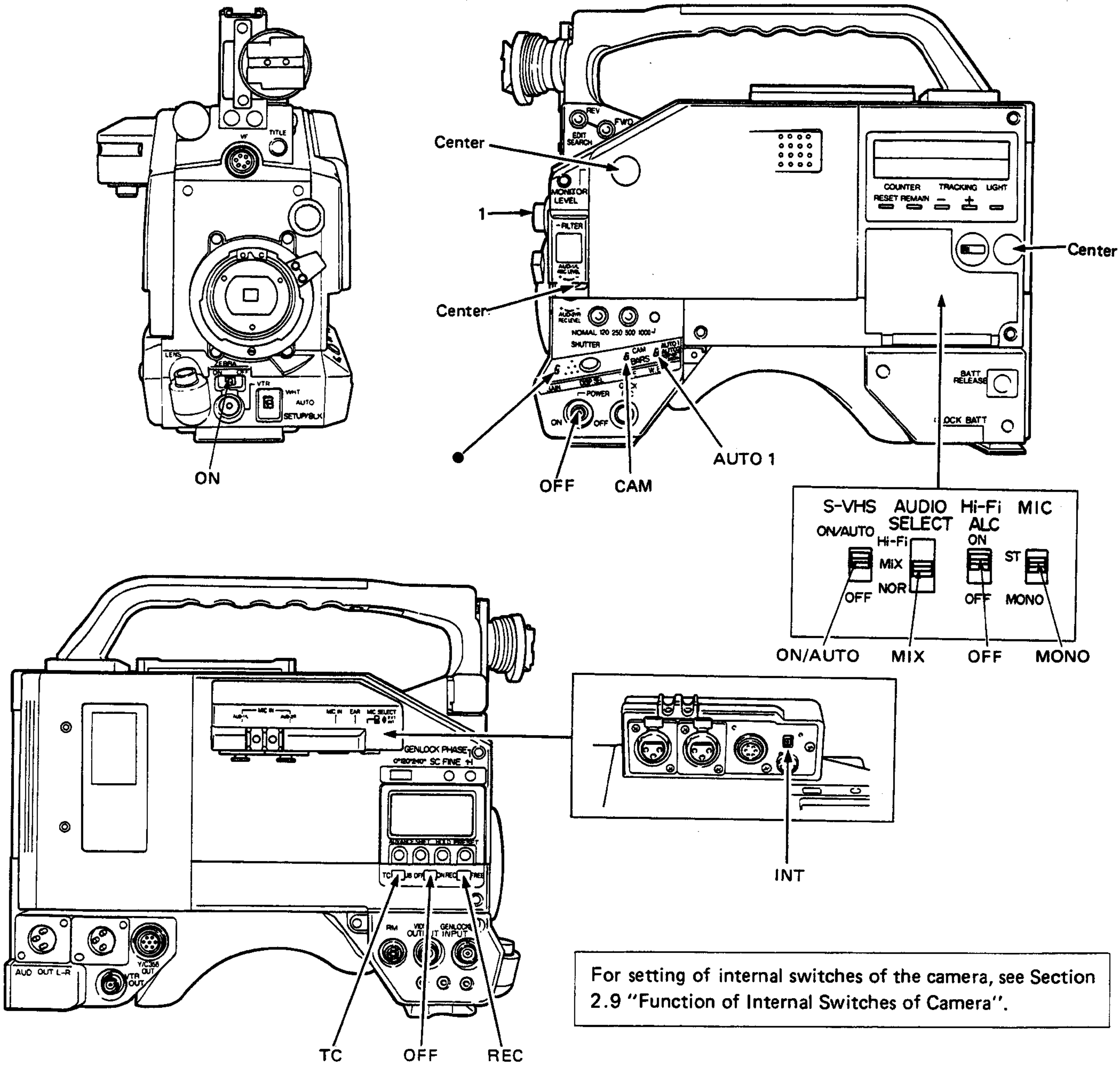
1	Reference signal level	Oscilloscope (H-rate, 10 : 1) or Waveform monitor (H-rate)	◎ VTR OUT (75 Ω termination) Ⓣ fa LEVEL [RF2] (VR2) ☆ 0.286 Vp-p  Ⓣ fb LEVEL [RF2] (VR2) ☆ 0.286 Vp-p	1) Observe the 17th line of the VTR OUT signal. 2) Adjust the reference signal level as specified.  **Note:** Reference signal may not be outputted or may be inserted on another line according to the setting of the DIP switch S1 on the RF1 board. For setting of S1, refer to Section 2.9.2.

3.18 ADJUSTMENT OF THE TC BOARD

- Remove the TC board according to the section 2.4.4 and disconnect two connectors on the TC board.

1	Reset voltage	Oscilloscope (DC-range, 10 : 1)	◎ TP3 [TC] Ⓣ 4.7 V ADJ[TC] (VR1)	1) Supply 4.8 V DC to pin 7 of CN23. (Pin 6 : GND) 2) Connect an oscilloscope to TP3 and adjust VR1 to the point of which the voltage at TP3 changes from Hi to Low. 3) Supply 5 V DC to pin 7 of CN23. 4) Confirm that TP3 is Hi. 5) Change the voltage supplied to pin 7 slowly and confirm that TP3 changes from Hi to Low when 4.75 V DC is supplied.

3.19 INITIAL SWITCH SETTING AT SHIPMENT


Center
1
Center
Center
ON
OFF
CAM
AUTO 1
TITLE
VF
LENS
ZEBRA
VTR
WHT
AUTO
SETUP/BLK
REV
FWD
EDIT SEARCH
MONITOR LEVEL
FILTER
SHUTTER
POWER
COUNTER
RESET REMAIN
TRACKING
LIGHT
BATT RELEASE
LOCK BATT
S-VHS
ON/AUTO
AUDIO SELECT
Hi-Fi ALC
MIC
Hi-Fi
MIX
NOR
ON
OFF
ST
MONO
ON/AUTO
MIX
OFF
MONO
GENLOCK PHASE
SC FINE
MIC IN
EAR
MIC SELECT
AUD OUT L-R
Y/C358 OUT
VTR OUT
RM
VIDEO OUT
GENLOCK INPUT
INT
TC
OFF
REC

For setting of internal switches of the camera, see Section 2.9 "Function of Internal Switches of Camera".

3.20 CAUTION FOR OVERHAULING

For overhauling GY-X1, it is the most important thing to initialize the internal memory as well as existing custom scene file of the memory card provided as an accessory.

- To initialize internal memory:
  Refer to "Initializing data" described on page 41 of the instruction book.
- To initialize custom scene file:
  After initializing the internal memory, write the initializing data in the custom scene file.
  For detail, refer to the description of "Storing a scene file" on page 34 of the instruction book.
  (Fill in the blank space for comments with non-data impression by spacing.)

- **Camera head section assembly parts list M 1**

M 1 M M □□□□

Symbol No.	Part No.	Part Name	Description
⚠ 1	SC31342-021	Window	
⚠ 2	SC20412-003	Cover	
3	SC43023-006	Rubber	
4	SC43397-006	Screw	
5	SC44536-001	Shaft	
⚠ 6	SC31340-032	Escutcheon	for GY-X1TC
7	SC44557-001	Cap	for GY-X1TC
8	SC10116-042	Side Cover(L)	for GY-X1TC
	SC10116-032	Side Cover (L)	for GY-X1
9	SC44556-002	Knob	for GY-X1TC
10	WLS2000N	Washer	
11	C40936	Spring	
12	SC40886-001	Guide	
13	SC44847-280	Shield Tube	280mm
14	SC10118-001	Handle	
⚠ 15	SCV1817-001	Mic Assembly	
16	SCV0238-06S	Connector	VF.6 pin
17	SC10111-002	Top Frame	
⚠ 18	SC31332-011	Cover	
⚠ 19	SC31302-011	Base	
⚠ 20	SC31333-001	Rubber	
21	PRD42968-03	Label	"When SE-C45/EC-45 cassettes are used……"
⚠ 22	SC31303-002	Rail	
23	SC43397-004	Screw	
24	SC43406-001	Cap	TITLE, EDIT FWD, SHUTTER 120·250·500·1000
25	SC10110-011	Rear Frame	
⚠ 26	SC20411-011	Rear Cover	
27	SC44847-040	Shield Tube	40mm
28	SC44514-011	Plate	
29	PRD42966-02	Label	"Slack tape may cause tape……"
⚠ 30	PRD42739-02	Contact Plate	
⚠ 31	PRD42739-01	Contact Plate	
32	PQ31568	Cover	
⚠ 33	SC44483-001	Slider Plate	
34	SC44561-002	Knob	S-VHS, AUDIO SELECT, HiFi, MIC
35	SC44537-001	Bracket	
⚠ 36	SCV1784-001	Speaker	
37	SC44566-002	Cushion	
38	SC10115-041	Side Cover (R)	
39	SC44946-001	CAP	
⚠ 40	SC31345-003	Window	
⚠ 41	SC31346-003	Cover	Function Box
42	SC44569-002	Shaft	
43	SC20434-002	Cheek Pad	
44	SC43451-001	Lens	
45	SC44828-011	Knob	
⚠ 46	SCV0316-03P	XLR Connector	AUDIO OUTPUT L/R
⚠ 47	SCV1977-04P	XLR Connector	DC INPUT
48	SCV1214-002	Connector	Y/C OUTPUT,7pin
49	SCV0749-011	BNC Connector	VTR OUT·VIDEO OUT·GENLOCK IN
50	SC20429-021	Cover	
51	—	Nut & Washer	Included ㊽
52	—	Nut & Washer	Included ㊾
53	SC10117-001	Base	
⚠ 54	SC31299-002	Button	BATT RELEASE
55	SC44484-001	Contact	

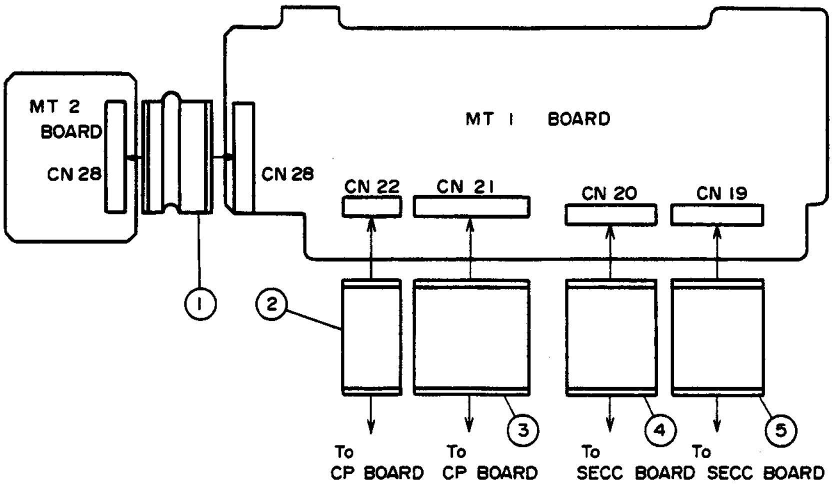
Symbol No.	Part No.	Part Name	Description
⚠ 56	SC20413-002	Cover	
⚠ 57	SC31326-002	Holder	for clock battery
58	SC31335-001	Rear Base	
59	SC10126-002	Shoulder Pad	
⚠ 60	SC44577-002	Plate	Switch name
61	SC20408-011	Cover	
62	SC43468-001	Cushion	
63	SC41214-004	Knob	QUICK REC
64	SC31334-001	Front Base	
65	SC10114-011	Bottom Frame	
66	SCV1517-001	Connector	RM (for GY-X1TC)
67	—	Nut & Washer	Included (66)
68	SC20416-021	Cover	for GY-X1TC
	SC20416-011	Cover	for GY-X1
69	SCV1829-001	VTR Deck Assembly	
70	SC44490-001	Shaft	
71	SC44488-001	Sheet	
72	SC43840-001	Filter	3200K
73	SC43841-001	Filter	5600K
74	SC43842-002	Filter	5600K+ND
75	SC31301-001	Filter Wheel	
⚠ 76	SC31306-002	Cover	
77	SC44491-001	Shaft	
78	SC44485-001	Gear	
79	SC44486-001	Shaft	
80	SC44676-003	Cap	
⚠ 81	SC31307-001	Base	
82	SC44482-002	Stopper	
83	SC44511-001	Spring	
84	SCM0575-POA	Optical Block Assembly	
85	SC44492-001	Plate	
86	SC31300-003	Holder	
87	SC44493-003	Quartz Filter	
88	SC43825-002	Cap	
89	SC43855-001	Lever	
90	SC40779-001	Guide Pin	
91	SC31324-001	Bracket	
92	SC44847-050	Shield Tube	50mm
93	SC31323-003	Filter Knob	
94	SC10113-001	Front Frame	
⚠ 95	SCV1938-12S	Connector	LENS, 12 pin
96	SC44538-001	Cap	
97	SC44847-090	Shield Tube	90mm
98	SDSP2604R	Screw	M2.6×4
99	SSSP3010M	Screw	M3×10
100	SDSF2006M	Screw	M2×6
101	LPSP3004Z	Screw	M3×4
102	LPSP3006Z	Screw	M3×6
103	LPSP3008Z	Screw	M3×8
104	SDSP2004N	Screw	M2×4
105	SDSP2006M	Screw	M2×6
106	SDSP2605M	Screw	M2.6×5
107	SDSP2606M	Screw	M2.6×6
108	SDSP3006M	Screw	M3×6
109	SDSP3006Z	Screw	M3×6
110	SDSP4006M	Screw	M4×6

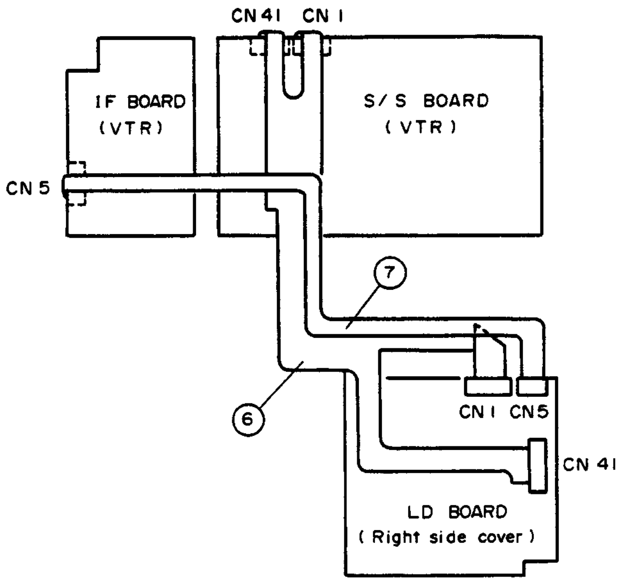
Symbol No.	Part No.	Part Name	Description
111	SPSK2020M	Screw	M2×2
112	SPSK2025M	Screw	M2×2.5
113	SDSP2004M	Screw	M2×4
114	SPSK2050M	Screw	M2×50
115	SPSK2640M	Screw	M2.6×40
116	SPSP2003N	Screw	M2×3
117	SPSP2606N	Screw	M2.6×6
118	SSSK2040M	Screw	M2×4
119	SSSP2604M	Screw	M2.6×4
120	SSSP3006N	Screw	M3×6
121	TRS2606M	Screw	M2.6×6
122	SDSP3010M	Screw	M3×10
123	SSSP2606M	Screw	M2.6×6
124	SC31309-011	Lock Base	
125	SC41128-001	Spring	
126	SC44547-002	Lock Ring	
127	SC44839-011	Cushion Ring	
128	SC44546-011	Slide Plate	
129	SC40465-045	Steel Ball	
130	SC44945-001	Cable Holder	
131	SC44827-001	Plate	
132	SC20464-001	Cover	
133	QMS3501-013	Earphone Jack	
134	SC31450-001	Plate	
⚠ 135	SCV0316-03S	XLR-Connector	MIC IN, 3 pin
⚠ 136	SCV0238-06S	Connector	MIC IN, 6 pin
137	–	Washer	Included 133
138	SC43431-011	Knob	MIC SELECT
139	SCV0255-001	Slide Switch	MIC SELECT (S17)
140	–	–	
141	DPSP3006Z	Screw	M3×6
142	SCV0337-002	Toggle Switch	ZEBRA ON/OFF (S11)
143	SCV1639-001	Push Switch	VTR (S10)
144	SCV0516-A18JB2	Toggle Switch	AUTO SETUP/BLK/WHT (S9)
⚠ 145	SC44820-002	Plate	
146	SC44828-001	Cap	EDIT REV, SHUTTER NOR, DISP SELECT
147	SC44833-001	Bracket	
148	SCV1639-001	Push Switch	EDIT REV, FWD, TITLE
149	SC44536-00	Shaft	
⚠ 150	SC31415-001	Shield Plate	
151	SC44932-001	Shield Plate	
⚠ 152	SC44852-002	Shield Plate	
⚠ 153	SC44847-060	Shield Tube	60mm
154	SC44847-180	Shield Tube	180mm
155	SC44847-120	Shield Tube	120mm
156	SC44836-001	Hinge	
157	Q03091-105	Washer	
158	SCV0516-A13HB2	Toggle Switch	GAIN (S3)
159	SCV1639-001	Push Switch	DISP SELECT (S4)
160	SCV0337-002	Toggle Switch	MODE CAM/BARS (S5)
⚠ 161	SCV0338-002	Toggle Switch	W.BAL AUTO1/AUTO2/PRESET (S6)
162	SCV0335-011	Toggle Switch	POWER ON/OFF (S1)
163	SCV1639-001	Push Switch	QUICK REC (S2)
164	SCV1951-001	VR	AUD REC LEVEL (VR1, VR2)
165	SCV1639-001	Push Switch	SHUTTER NOR/120·250·500·1000 (S7, S8)

Symbol No.	Part No.	Part Name	Description
166	LT3P8P	L.E.D.	SHUTTER (LD1)
167	SC44815-001	Felt	
168	SC44825-001	Label	Filter Allocation
169	SC44851-001	Label	Clock Battery Installation
⚠ 170	SCV1860-P13	LD Board Assembly	
⚠ 171	SCV1860-012	OP Board Assembly	
172	SC44670-012	Bracket	
173	SC44806-002	Knob	LIGHT, REMAIN, RESET, TRACKING
174	SC44818-001	Spring	
175	SC44816-001	Slider	
176	SDSP2004M	Screw	M2×4
177	Q03093-404	Spacer	
178	SC44817-003	Slide Knob	
179	SCM0560-U0A	Memory Card	
180	SC44824-001	Knob	
⚠ 181	SC20449-021	Base	
182	GB47110-031	Spring	
183	SC44562-012	Lock Knob	
184	—	—	
⚠ 185	SC31347-002	Holder	
186	SC44567-002	Spring	
187	SC44570-001	Bracket	
188	SC44568-002	Shaft	
189	—	—	
190	SC44564-012	Knob	MONITOR LEVEL
191	SDSF3006F	Screw	M3×6
192	DPSP3006Z	Screw	M3×6
193	SDSP4008M	Screw	M4×8
194	SDSF3006M	Screw	M3×6
195	SDSF2005M	Screw	M2×5
196	LPSP3006M	Screw	M3×6
197	SC44569-002	Cushion Rubber	
198	SC44869-005	Cushion Rubber	
199	SC44869-004	Cushion Rubber	
200	SC44907-001	Label	"PUSH"
201	Q03093-841	Washer	
202	LPSP2006Z	Screw	M2×6
203	Q03091-202	Washer	
204	SC44819-001	Knob Cap	
205	SBSF2606M	Screw	
206	SC44934-001	Nut	
207	—	Battery Board Ass'y	
208	SSSK2040M	Screw	M2×40
⚠ 209	SC44920-001	LCD Cover	
210	LPSP3010Z	Screw	M3×10
211	Q03093-819	Washer	
212	NTS6000M	Nut	
213	SC44867-001	Sheet	
214	Q03093-829	Washer	
215	Q03093-829	Washer	
216	SC31428-002	Sheet	
217	SDSP3006M	Screw	M3×6
218	SC44959-001	Stud	
219	SC31441-001	Cover	
220	SC44819-001	Knob Cap	

Symbol No.	Part No.	Part Name	Description
221	SC31428-002	Bracket	
222	SC41252-001	Caution Label	
223	SC45020-001	Shield Plate	
224	SPSK2030M	Screw	M2 x 3
⚠ 225	SC41252-001	Caution Label	for fuse replacement
⚠ 226	PU54392-1	Caution Label	"WARNING : SHOOK HAZARD ......"
227	–	–	
228	–	–	
229	–	–	
230	SC31340-012	E scutcheon	for GY-X1

5.3 FLAT CABLE ASSEMBLY


MT 2 BOARD
CN 28
CN 28
MT 1 BOARD
CN 22
CN 21
CN 20
CN 19
①
②
③
④
⑤
To CP BOARD
To CP BOARD
To SECC BOARD
To SECC BOARD


CN 41
CN 1
IF BOARD (VTR)
S/S BOARD (VTR)
CN 5
⑦
⑥
CN 1
CN 5
CN 41
LD BOARD (Right side cover)

- **Flat cables parts list** M 2

Symbol No.	Part No.	Part Name	Description
1	SCV1902-2507K	Flat Cable	
2	SCV1902-1009K	Flat Cable	
3	SCV1902-2509K	Flat Cable	
4	SCV1902-2004K	Flat Cable	
5	SCV1902-2004K	Flat Cable	
6	SCV1935-001	Flexible Printed Circuit	} Replace simultaneously.
7	SCV1935-002	Flexible Printed Circuit	

SECTION 6
CHARTS AND DIAGRAMS

6.1 SCHEMATIC DIAGRAM NOTES

- **Schematic safety precaution**

Parts are safety related aprts.
When replacing them, be sure to use the specified parts.

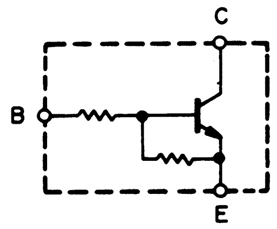
Voltage and waveform measurements.
Voltage: Measured with digital voltmeter in DC range; iris closed.
Waveform: Grey scale illuminated at more than 4000 lux at 3200 K lighting.

- Terminal logic

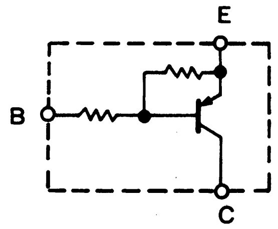
Top bar of terminal name show input or output logic.
Top bar shows, the control circuit become active at negative (low) logic input for example.

- Digital transistors

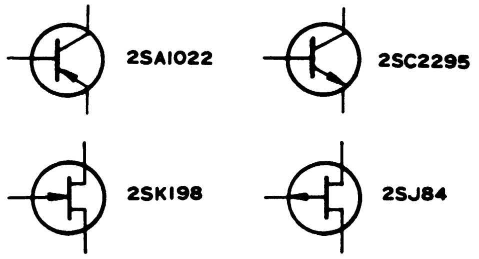
DTC124K



DTA124K/ES



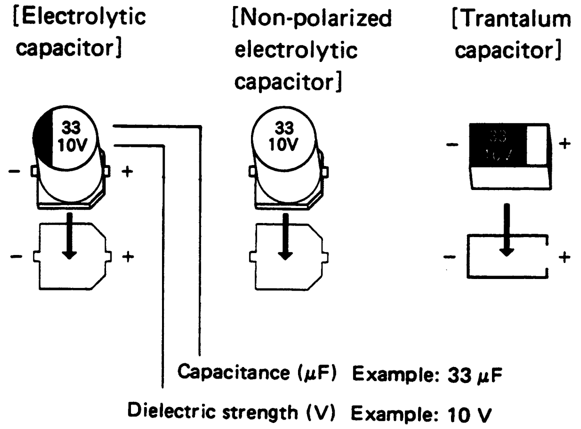
- Unless otherwise specified transistors and F.E.T.s are:


2SA1022
2SC2295
2SK198
2SJ84

- Definistion of the (A) and the (B) or circuit boards diagrams
  - (A) : Side on which discrete parts are assembled
  - (B) : Side on which only chip parts are assembled.

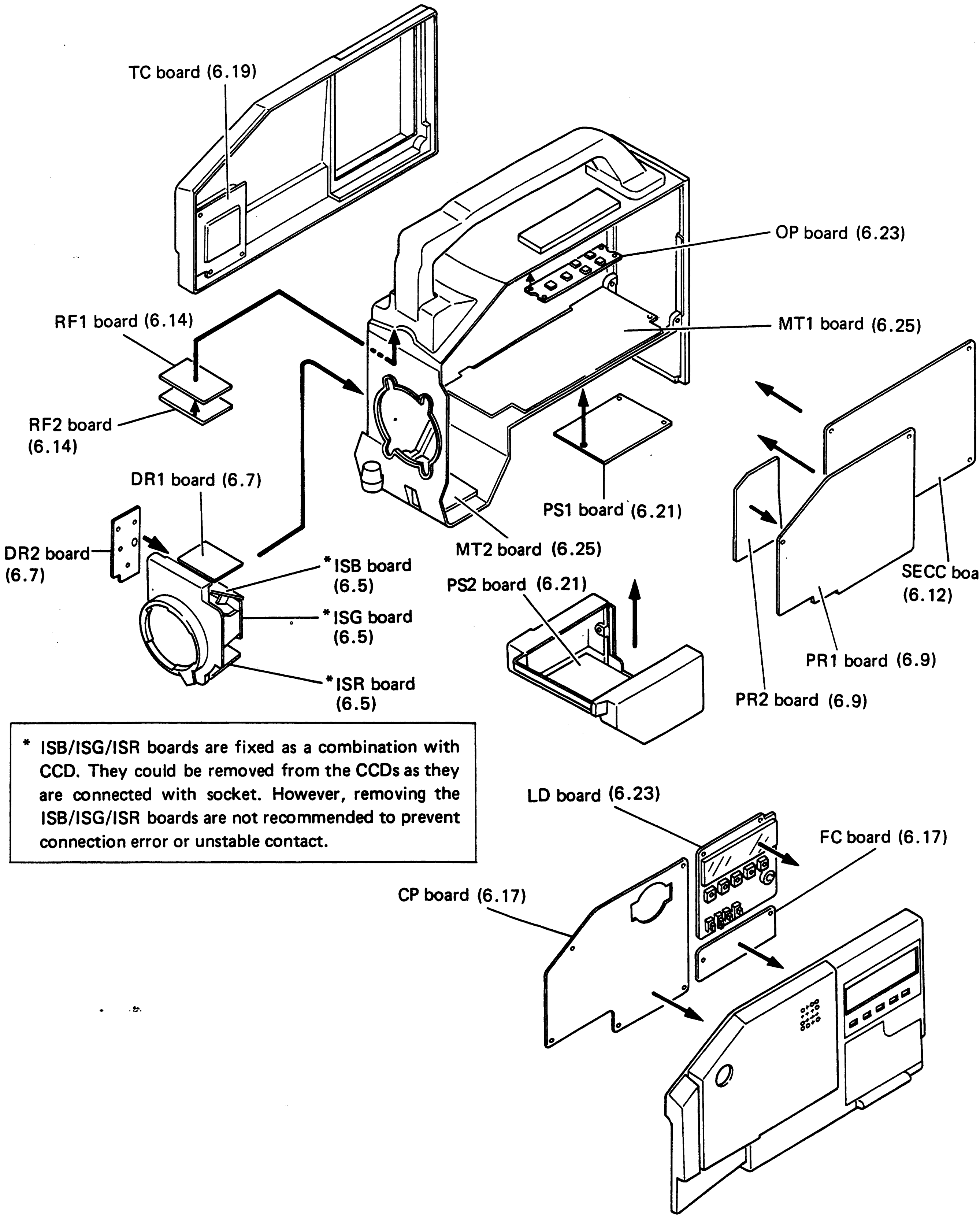
6.2 REPLACING SUBMINIATURE "CHIP" PARTS

- Some resistors, shoring jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
- Soldering cautions:
  1) Do not apply heat for more than 3 seconds.
  2) Avoid using a rubbing stroke when soldering.
  3) Discard removed chips; do not reuse them.
  4) Supplementary cementing is not required.
  5) Use care not to scratch or otherwise damage the chips.
- Resistors and capacitors are not interchangeable with chip parts which is used in the color cameras BY-110, KY-210, etc., because of size difference. In case of part order, refer to the section "ELECTRICAL PARTS LIST".
- Polarities of chip electrolytic capacitors and chip tanntalum capacitors used in GY-X1 are as illustrated below. Polarities indicated by silk-screen printing on P.C. boards are also shown below. When replacing such parts, make sure of polarities.


[Electrolytic capacitor]
[Non-polarized electrolytic capacitor]
[Trantalum capacitor]
33 10V
33 10V
-
+
-
+
-
+
-
+
Capacitance (μF) Example: 33 μF
Dielectric strength (V) Example: 10 V

6.3 INDEX TO MAIN CIRCUIT BOARDS

Note: Figures in parentheses ( ) show article numbers of the circuit diagrams.

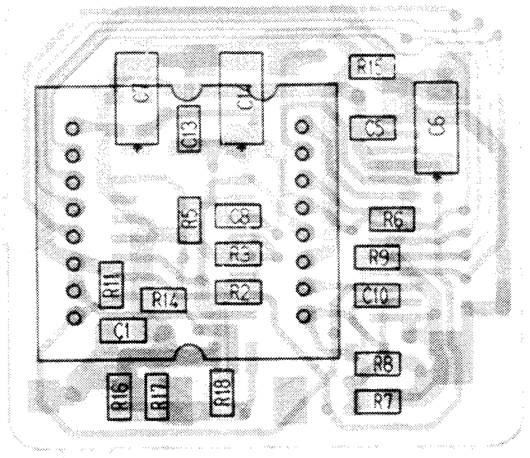

TC board (6.19)
OP board (6.23)
RF1 board (6.14)
MT1 board (6.25)
RF2 board (6.14)
DR1 board (6.7)
PS1 board (6.21)
DR2 board (6.7)
MT2 board (6.25)
*ISB board (6.5)
PS2 board (6.21)
SECC board (6.12)
*ISG board (6.5)
PR1 board (6.9)
*ISR board (6.5)
PR2 board (6.9)
LD board (6.23)
FC board (6.17)
CP board (6.17)

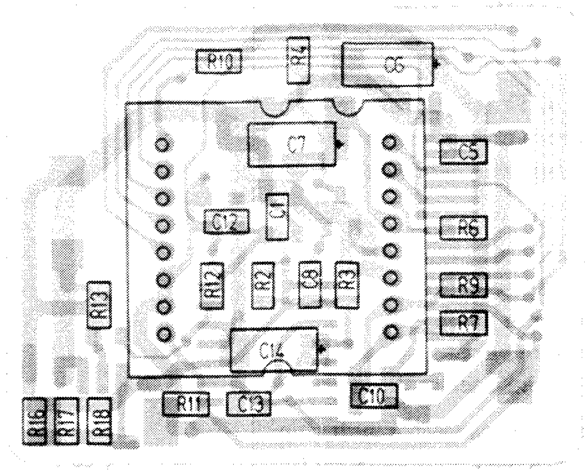
* ISB/ISG/ISR boards are fixed as a combination with CCD. They could be removed from the CCDs as they are connected with socket. However, removing the ISB/ISG/ISR boards are not recommended to prevent connection error or unstable contact.

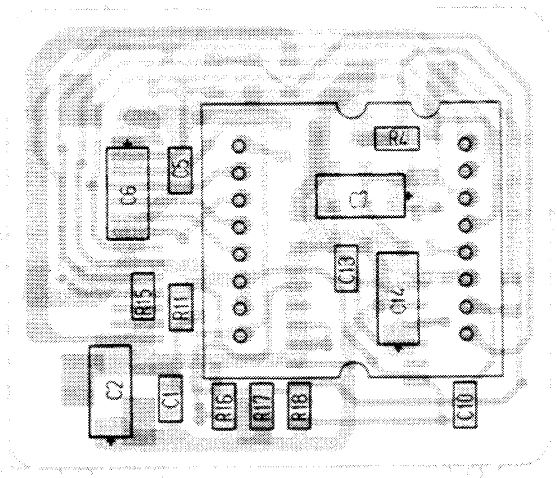
6.4 ISB/ISG/ISR CIRCUIT BOARDS

● ISB board **● ISG board** **● ISR board**

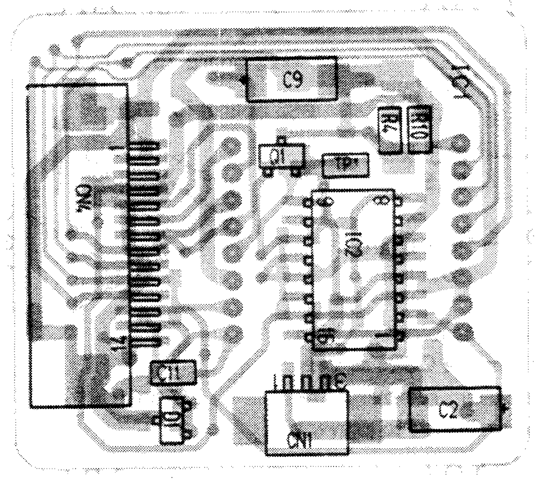
Parts side view (A)

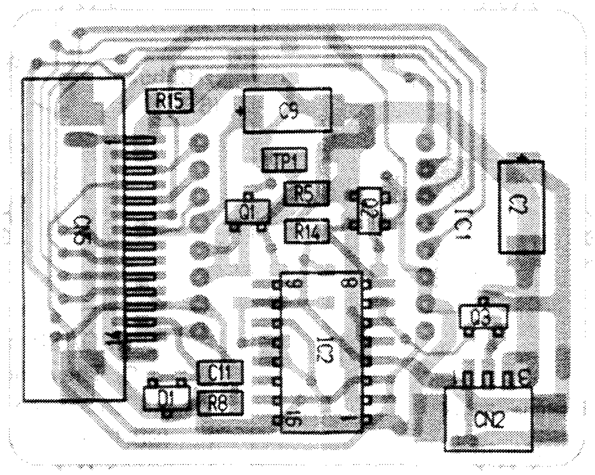

R15
C7
C14
C13
C5
C6
R5
C8
R3
R6
R9
R11
R14
R2
C10
C1
R8
R16
R17
R18
R7

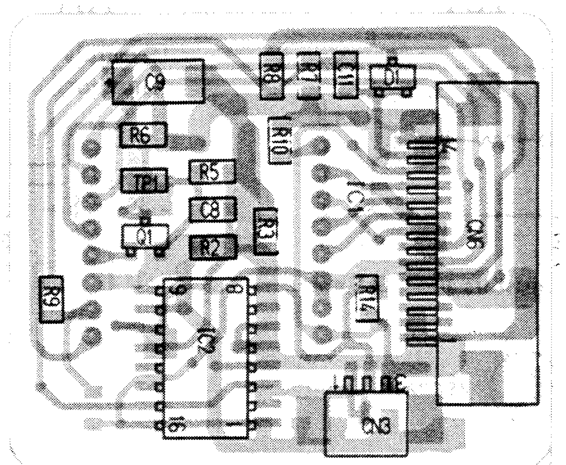

R10
R4
C6
C7
C5
C12
C1
R6
R12
R2
C8
R3
R9
R13
R7
C14
R11
C13
C10
R16
R17
R18

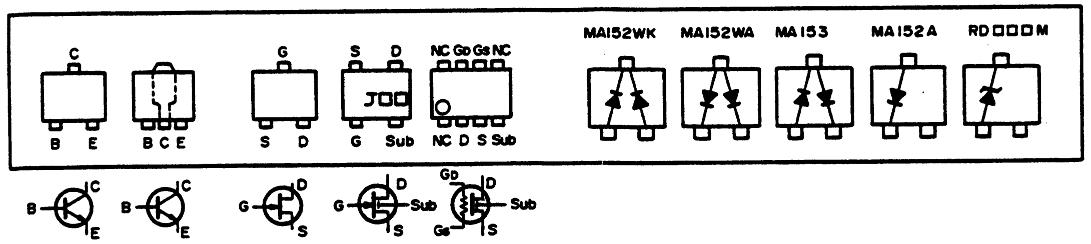

R4
C6
C5
C7
C13
C14
R15
R11
C2
C1
R16
R17
R18
C10

Soldered side view (B)

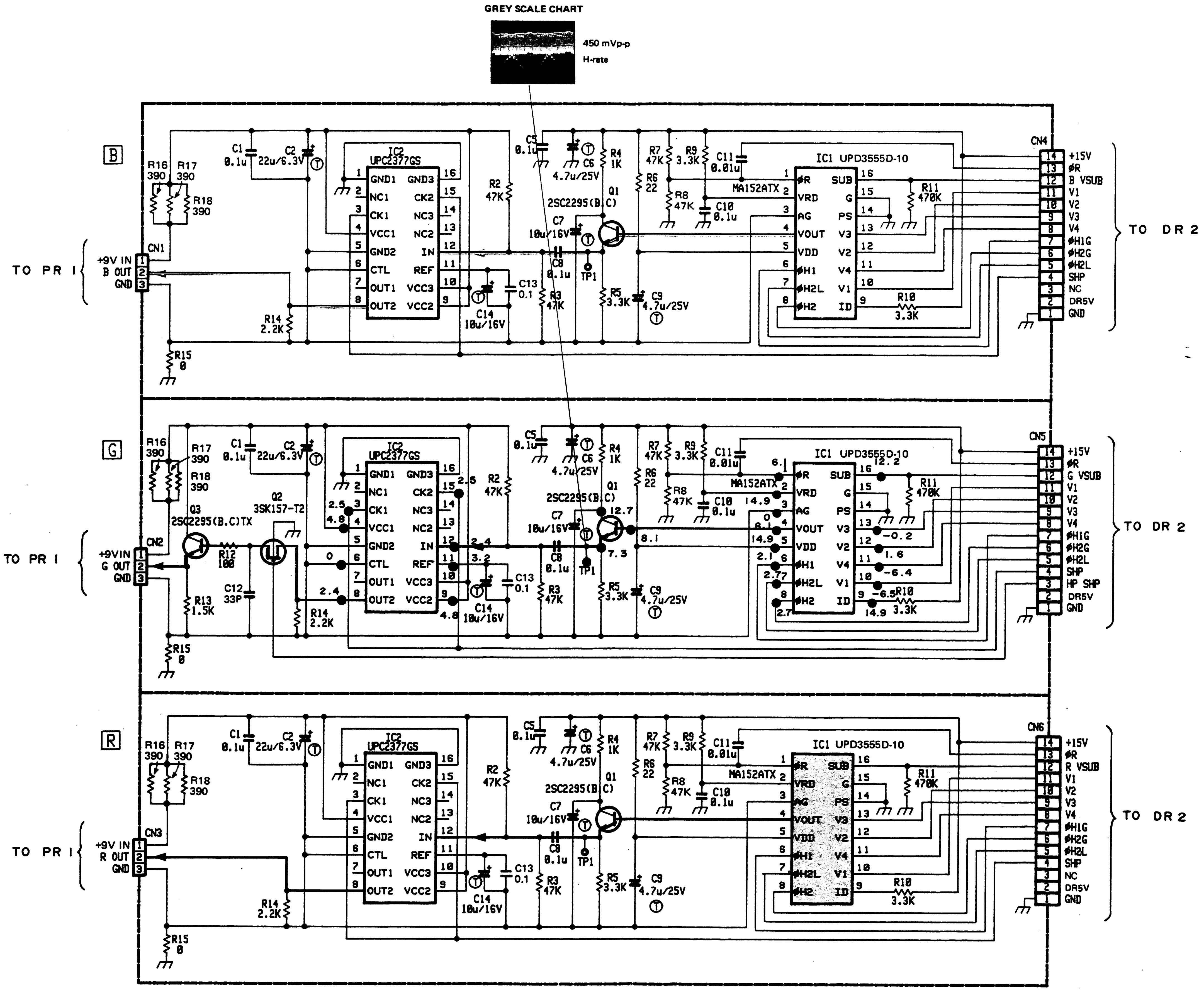

C9
IC1
R4
R10
Q1
TP1
CN4
IC1
1
8
9
16
14
C11
D1
CN1
C2


R15
C9
TP1
R5
Q1
Q2
R14
IC1
C3
CN5
IC2
1
8
9
16
Q3
C11
D1
R8
CN2


C9
R8
R7
C11
D1
R6
R10
TP1
R5
C8
Q1
R2
R3
IC1
CN6
R9
IC3
R14
CN3


C
B E
B C E
G
S D
S D
J00
G Sub
NC Gb Gs NC
NC D S Sub
MA152WK
MA152WA
MA153
MA152A
RD□□□M
B
C
E
G
D
S
Sub
Gb
Gs

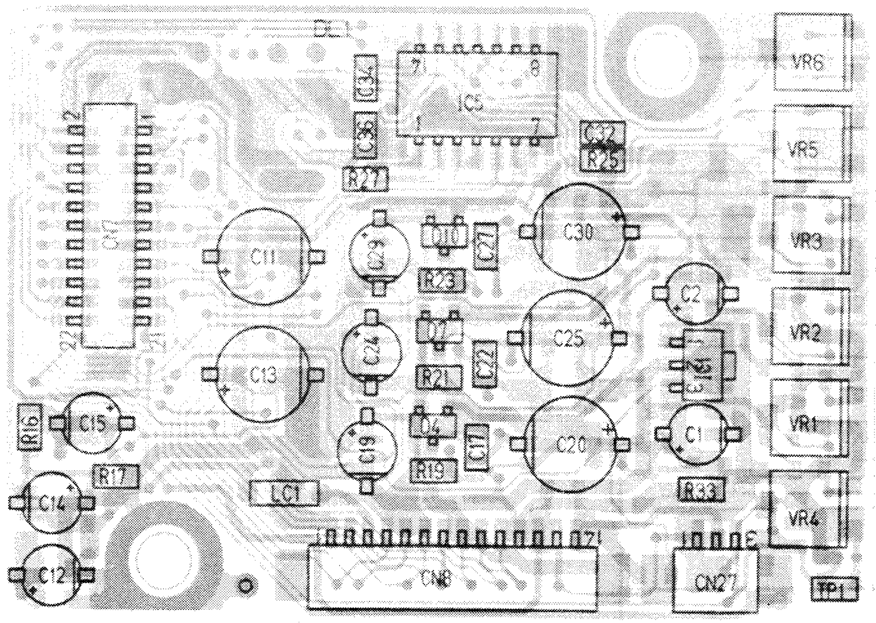
6.5 ISB/ISG/ISR BOARDS SCHEMATIC DIAGRAM


GREY SCALE CHART
450 mVp-p
H-rate
B
G
R
TO PR I
+9V IN
B OUT
G OUT
R OUT
GND
CN1
CN2
CN3
CN4
CN5
CN6
R16 390
R17 390
R18 390
R15 0
R14 2.2K
C1 0.1u
C2 22u/6.3V
IC2 UPC2377GS
GND1
NC1
CK1
VCC1
GND2
CTL
OUT1
OUT2
GND3
CK2
NC3
NC2
IN
REF
VCC3
VCC2
R2 47K
C13 0.1
C14 10u/16V
C5 0.1u
C6 4.7u/25V
R4 1K
Q1 2SC2295(B.C)
C7 10u/16V
C8 0.1u
TP1
R3 47K
R5 3.3K
C9 4.7u/25V
R7 47K
R9 3.3K
R6 22
R8 47K
C11 0.01u
C10 0.1u
MA152ATX
IC1 UPD3555D-10
φR
VRD
AG
VOUT
VDD
φH1
φH2L
φH2
SUB
G
PS
V3
V2
V4
V1
ID
R11 470K
R10 3.3K
Q3 2SC2295(B.C)TX
Q2 3SK157-T2
R12 100
R13 1.5K
C12 33P
+15V
B VSUB
G VSUB
R VSUB
V1
V2
V3
V4
φH1G
φH2G
φH2L
SHP
HP SHP
NC
DR5V
GND
TO DR 2

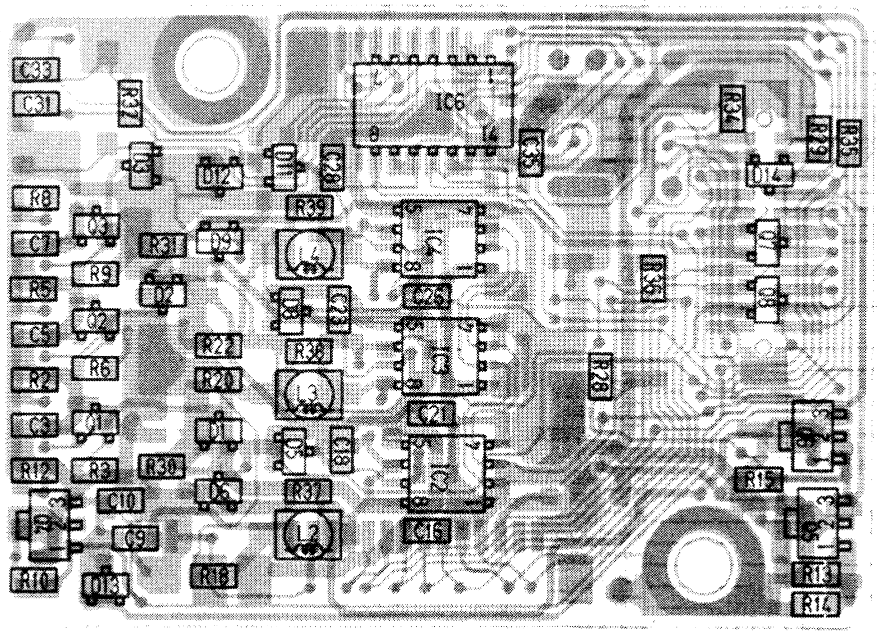
6.6 DR1/DR2CIRCUIT BOARDS

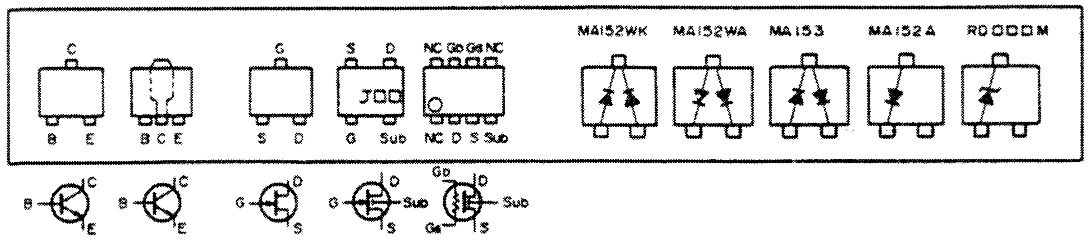
● DR1 board

Parts side view (A)


DL1
IC7
IC5
C34
C36
C32
R25
R27
C11
C29
D10
C27
C30
R23
C2
C13
C24
R21
C22
C25
C16
R16
C15
C19
C17
C20
C1
R17
R19
LC1
R33
C14
C12
CN8
CN27
VR6
VR5
VR3
VR2
VR1
VR4
TP1

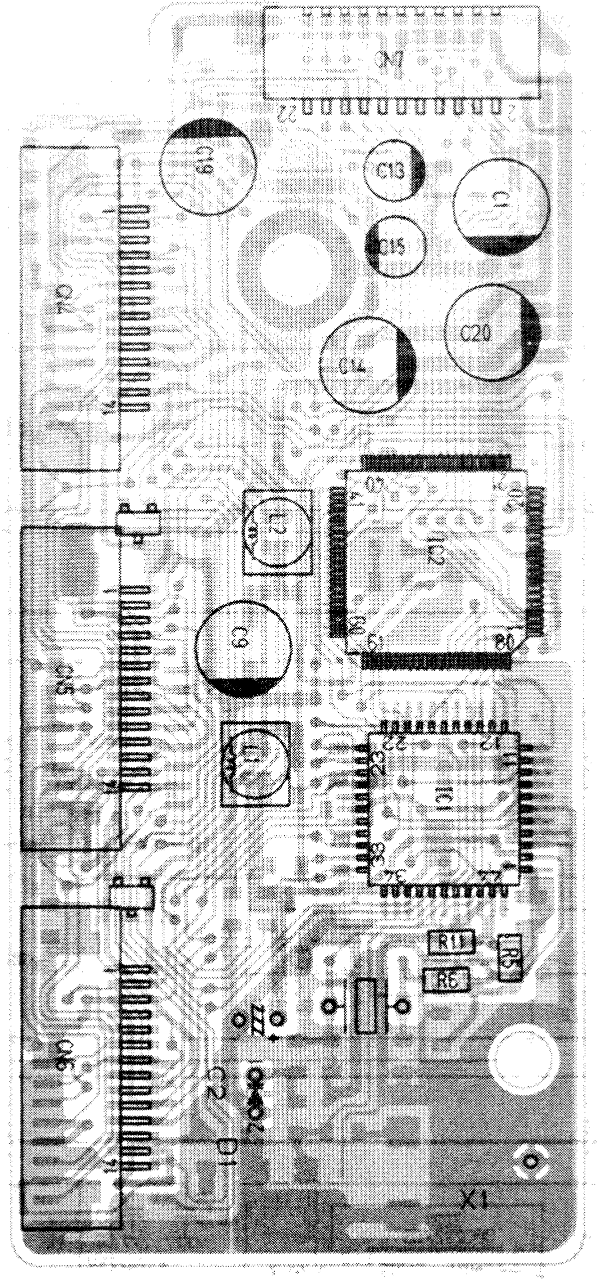
Soldered side view (B)


C33
C31
R32
IC6
R34
R35
D12
R29
D14
R8
R39
IC1
C7
R9
R31
D9
L4
D2
R36
R5
C5
Q2
R22
R38
C26
R2
R6
R20
L3
C21
R28
C3
R12
R3
R30
D6
R37
R15
C10
C9
L2
C15
R10
D13
R18
R13
R14

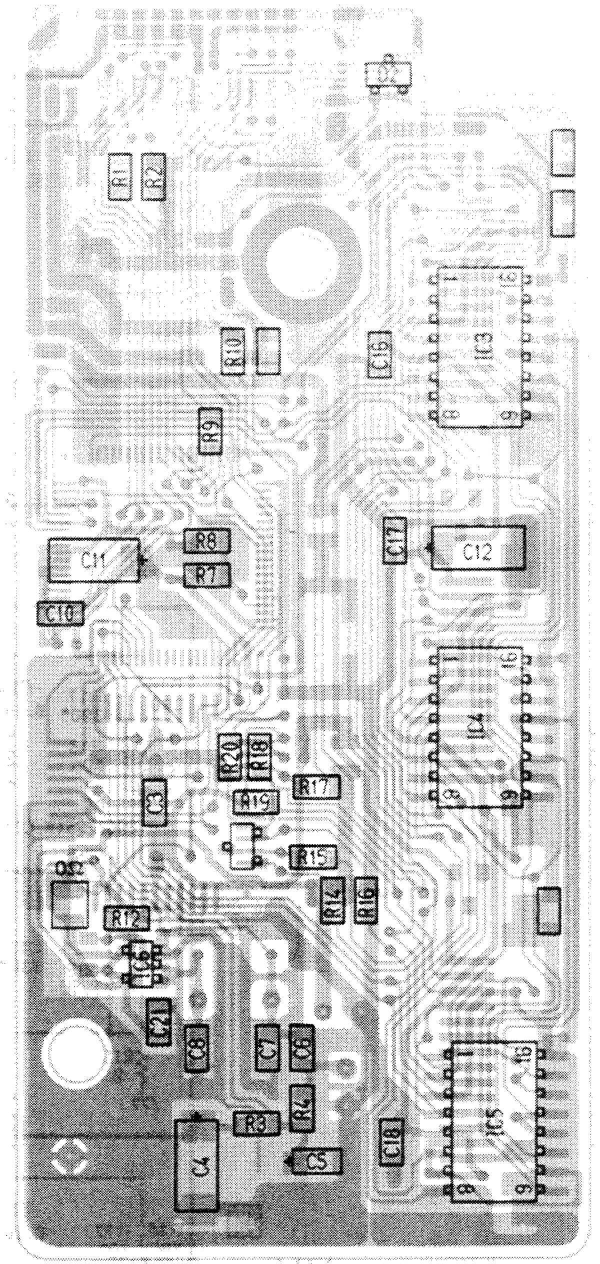

C
B E
B C E
G
S D
S D
G Sub
NC Gb Ga NC
NC D S Sub
MA152WK
MA152WA
MA153
MA152A
RD□□□M
B
C
E
G
D
S
Sub
Gb
Ga

● DR2 board

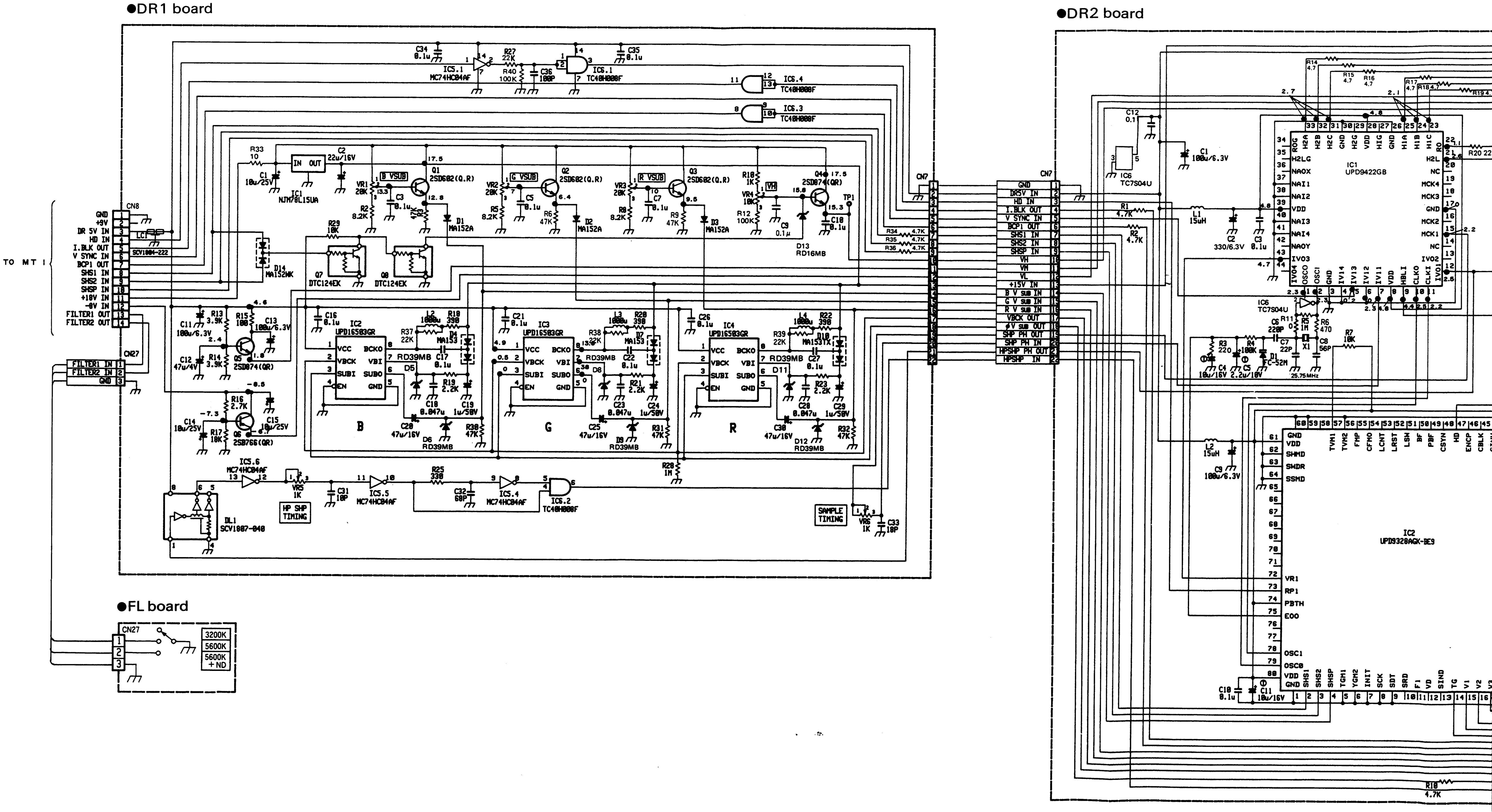
Parts side view


CN7
C19
C13
C15
C14
C20
IC2
L2
C9
L1
CN5
CN6
IC1
R11
R6
R5
X1

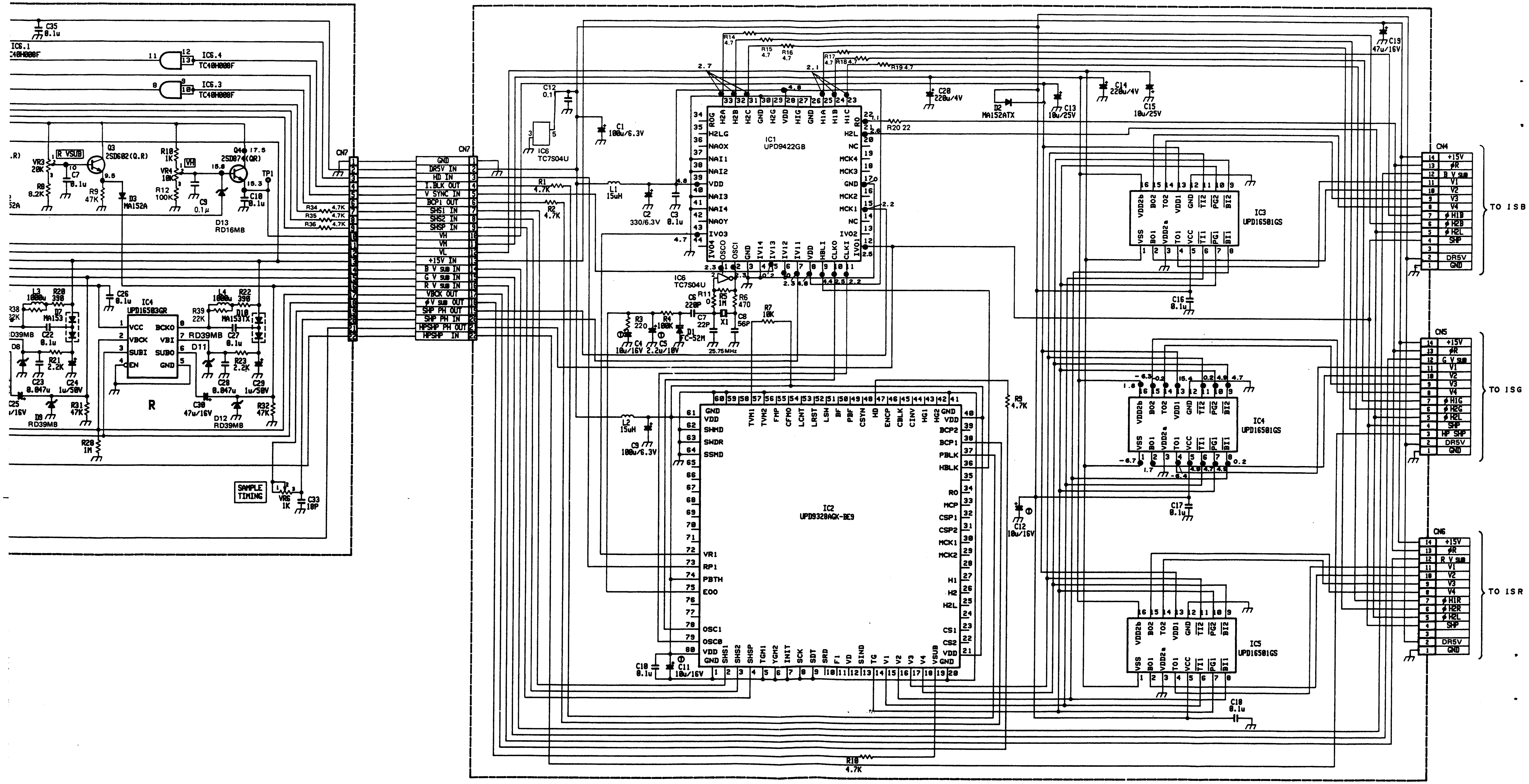
Soldered side view


Q2
R1
R2
IC3
R10
C16
R9
C11
C17
C12
R8
R7
C10
R20
R18
IC4
R17
C3
R19
R15
R14
R16
R12
C21
C8
C7
C6
R3
R4
C18
IC5
C4
C5

6.7 DR1/DR2/FL BOARD SCHEMATIC DIAGRAM


●DR1 board
●DR2 board
●FL board
TO MT I
CN8
GND
+9V
DR 5V IN
HD IN
I.BLK OUT
V SYNC IN
BCP1 OUT
SHS1 IN
SHS2 IN
SHSP IN
+18V IN
-8V IN
FILTER1 OUT
FILTER2 OUT
CN27
FILTER1 IN
FILTER2 IN
GND
LC1
SCV1004-222
D14 MA152WK
IC1 NJM78L15UA
IN OUT
R33 10
C1 10u/25V
C2 22u/16V
B VSUB
G VSUB
R VSUB
VH
Q1 2SD602(Q.R)
Q2 2SD602(Q.R)
Q3 2SD602(Q.R)
Q4 2SD874(QR)
D1 MA152A
D2 MA152A
D3 MA152A
D13 RD16MB
TP1
Q7 DTC124EK
Q8 DTC124EK
R29 10K
IC5.1 MC74HC04AF
IC6.1 TC40H000F
IC6.4 TC40H000F
IC6.3 TC40H000F
C34 0.1u
C35 0.1u
C36 100P
R27 22K
R40 100K
IC2 UPD16503GR
IC3 UPD16503GR
IC4 UPD16503GR
VCC BCKO
VBCK VBI
SUBI SUBO
EN GND
B
G
R
RD39MB
D5
D8
D11
D4 MA153
D7 MA153
D10 MA153TX
D6 RD39MB
D9 RD39MB
D12 RD39MB
Q5 2SD874(QR)
Q6 2SB766(QR)
C11 100u/6.3V
C12 47u/4V
C13 100u/6.3V
C14 10u/25V
C15 10u/25V
IC5.6 MC74HC04AF
VR5 1K
HP SHP TIMING
C31 10P
IC5.5 MC74HC04AF
R25 330
C32 68P
IC5.4 MC74HC04AF
IC6.2 TC40H000F
R28 1M
SAMPLE TIMING
VR6 1K
C33 10P
DL1 SCV1007-040
CN7
GND
DR5V IN
HD IN
I.BLK OUT
V SYNC IN
BCP1 OUT
SHS1 IN
SHS2 IN
SHSP IN
VH
VM
VL
+15V IN
B V SUB IN
G V SUB IN
R V SUB IN
VBCK OUT
ΦV SUB OUT
SHP PH OUT
SHP PH IN
HPSHP PH OUT
HPSHP IN
R34 4.7K
R35 4.7K
R36 4.7K
CN27
3200K
5600K
5600K +ND
IC6 TC7S04U
C12 0.1
C1 100u/6.3V
R1 4.7K
R2 4.7K
L1 15uH
C2 330/6.3V
C3 0.1u
IC1 UPD9422GB
ROG H2A H2B H2C GND H2G VDD H1G GND H1A H1B H1C RO
H2LG NAOX NAI1 NAI2 VDD NAI3 NAI4 NAOY IVO3
H2L NC MCK4 MCK3 GND MCK2 MCK1 NC IVO2
IVO4 OSCO OSCI GND IV14 IV13 IV12 IV11 HBLI CLKO CLKI IVO1
R14 4.7
R15 4.7
R16 4.7
R17 4.7
R18 4.7
R19 4.7
R20 22
X1 FC-52M 25.75MHz
R3 220
R4 100K
R5 1M
R6 470
R7 10K
C4 10u/16V
C5 2.2u/10V
C6 220P
C7 22P
C8 56P
L2 15uH
C9 100u/6.3V
C10 0.1u
C11 10u/16V
IC2 UPD9320AGK-BE9
GND VDD SHMD SHDR SSMD
VR1 RP1 PBTH EOO
OSC1 OSC0 VDD GND
SHS1 SHS2 SHSP TGH1 TGH2 INIT SCK SDT SRD F1 VD SIND TG V1 V2
TVH1 TVH2 FHP CFMO LCNT LRST LSN BF PBF CSYN HD ENCP CBLK
R10 4.7K

●DR2 board

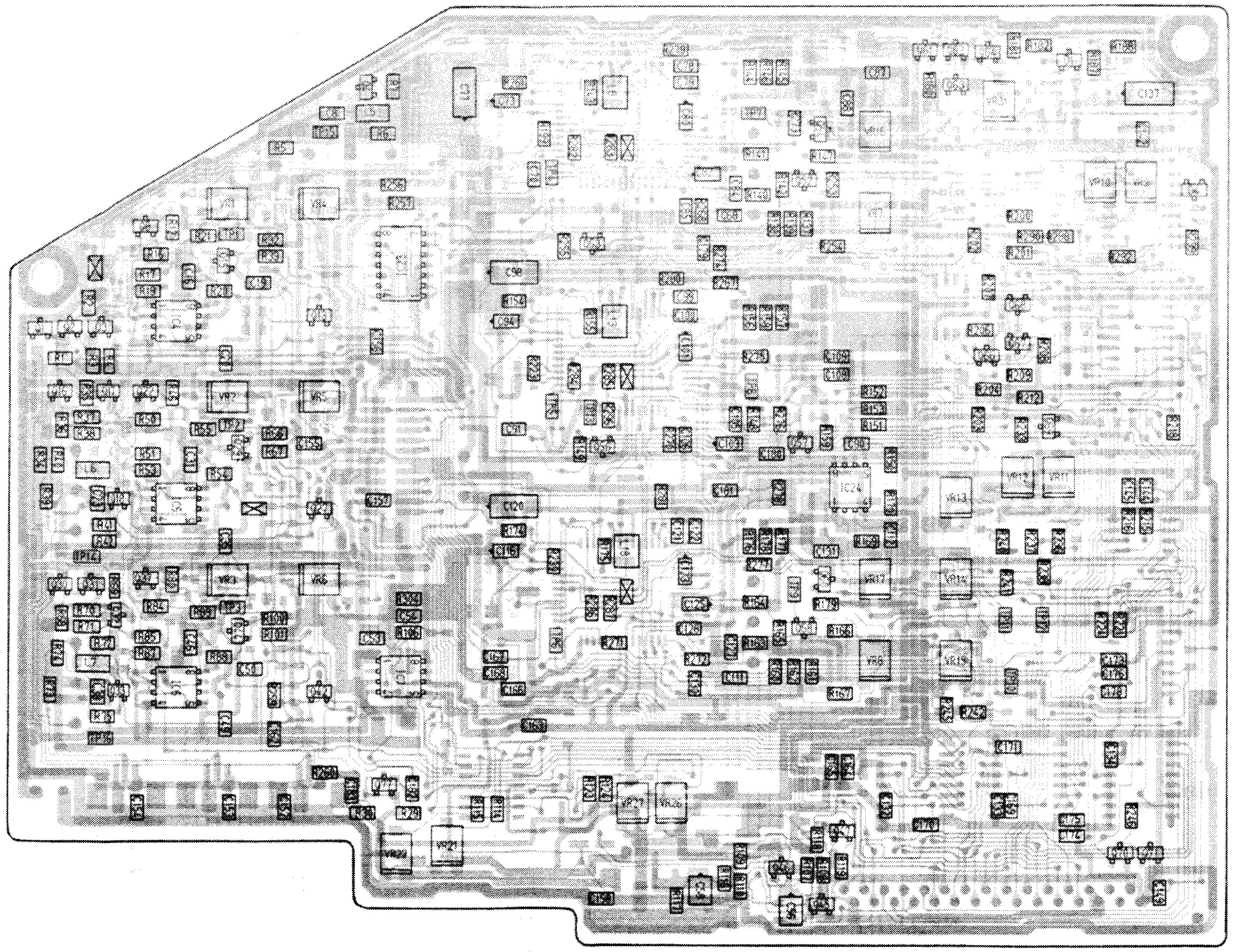


IC6.1
IC6.4
TC40H008F
IC6.3
TC40H008F
R VSUB
Q3
2SD602(Q.R)
Q4
2SD874(QR)
VR3 20K
VR4 10K
VH
R9 47K
D3 MA152A
R12 100K
C9 0.1μ
D13 RD16MB
TP1
C10 0.1u
CN7
R34 4.7K
R35 4.7K
R36 4.7K
IC4
UPD16503GR
VCC
VBCK
SUBI
EN
BCKO
VBI
SUBO
GND
RD39MB
R
SAMPLE TIMING
VR6 1K
C33 10P
R20 1M
GND
DR5V IN
HD IN
I.BLK OUT
V SYNC IN
BCP1 OUT
SHS1 IN
SHS2 IN
SHSP IN
VH
VM
VL
+15V IN
B V SUB IN
G V SUB IN
R V SUB IN
VBCK OUT
φV SUB OUT
SHP PH OUT
SHP PH IN
HPSHP PH OUT
HPSHP IN
IC1
UPD9422GB
IC2
UPD9320AGK-BE9
IC6
TC7S04U
L1 15uH
L2 15uH
C1 100u/6.3V
C9 100u/6.3V
X1
FC-32M
25.75MHz
D2 MA152ATX
C20 220u/4V
C14 220u/4V
C13 10u/25V
C15 10u/25V
C19 47u/16V
C12 10u/16V
R9 4.7K
R10 4.7K
IC3
UPD16501GS
IC4
UPD16501GS
IC5
UPD16501GS
CN4
CN5
CN6
+15V
φR
B V SUB
G V SUB
R V SUB
V1
V2
V3
V4
φH1B
φH2B
φH2L
φH1G
φH2G
φH1R
φH2R
SHP
HP SHP
DR5V
GND
TO ISB
TO ISG
TO ISR

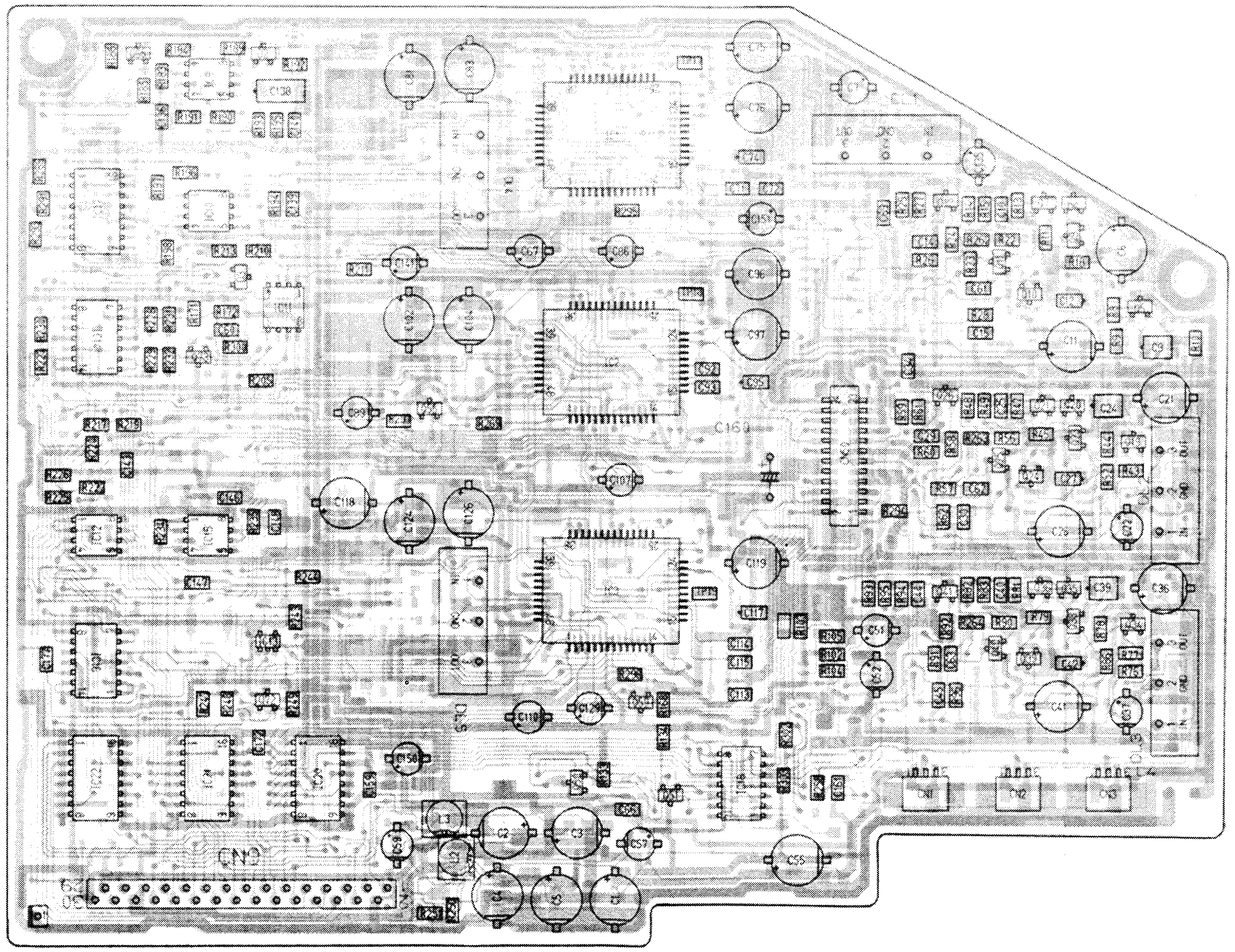
6.8 PR1/PR2 CIRCUIT BOARDS

● PR1 board

Parts side view (A)

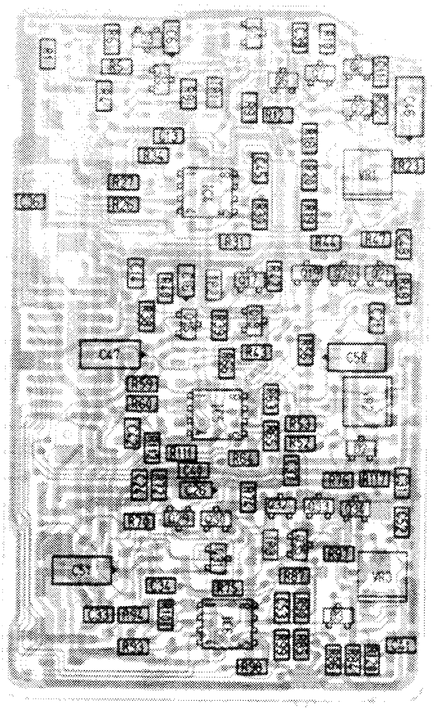


Soldered side view (B)

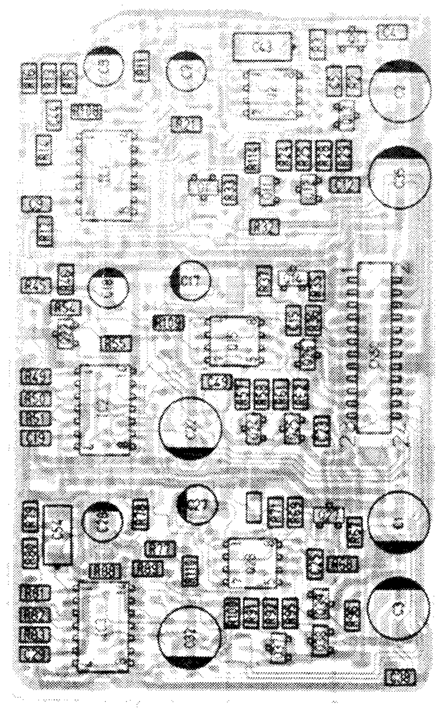


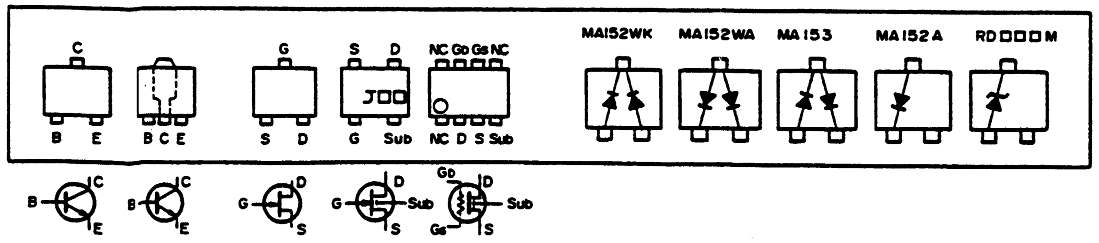
●PR2 board

Parts side view (A)

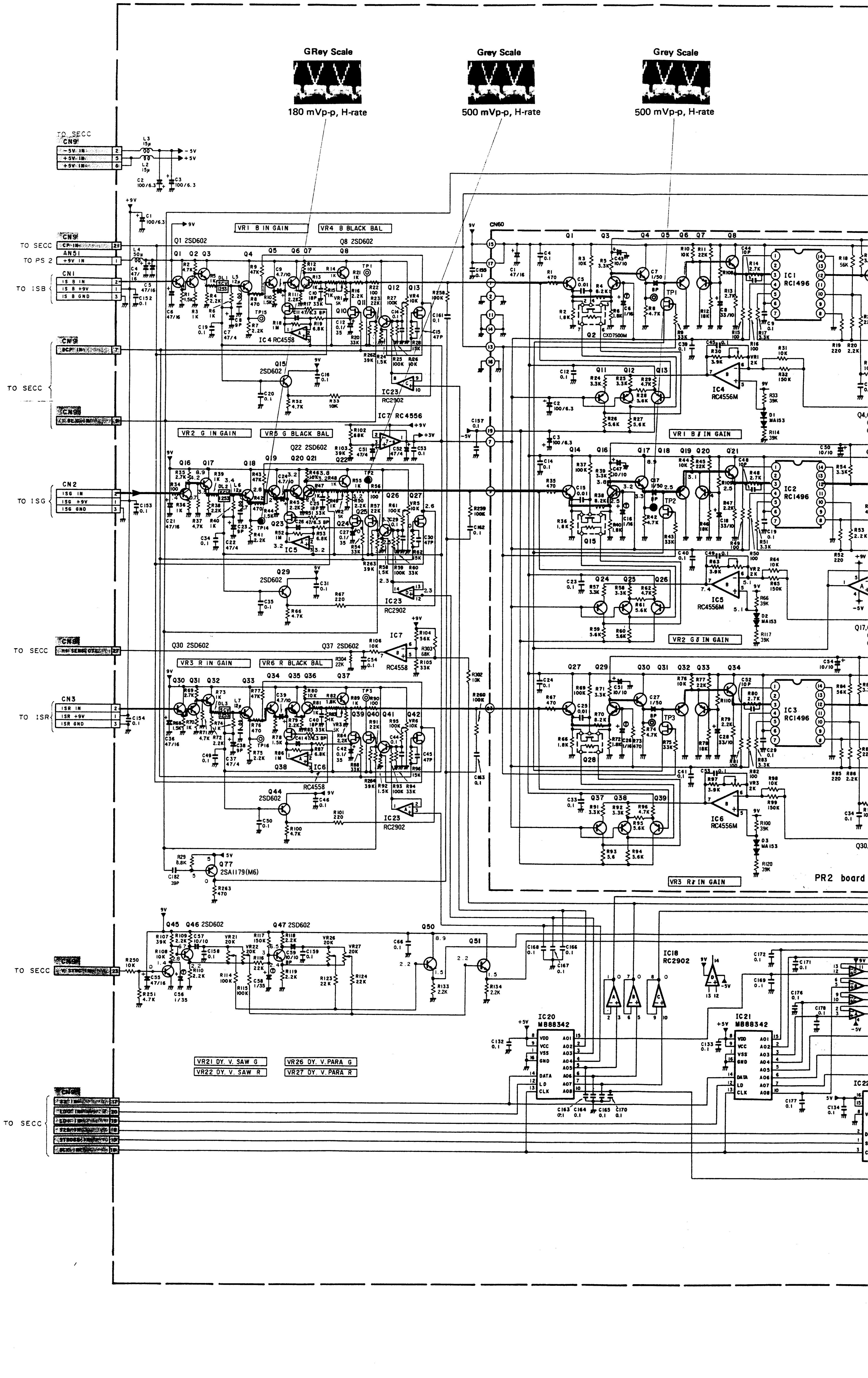


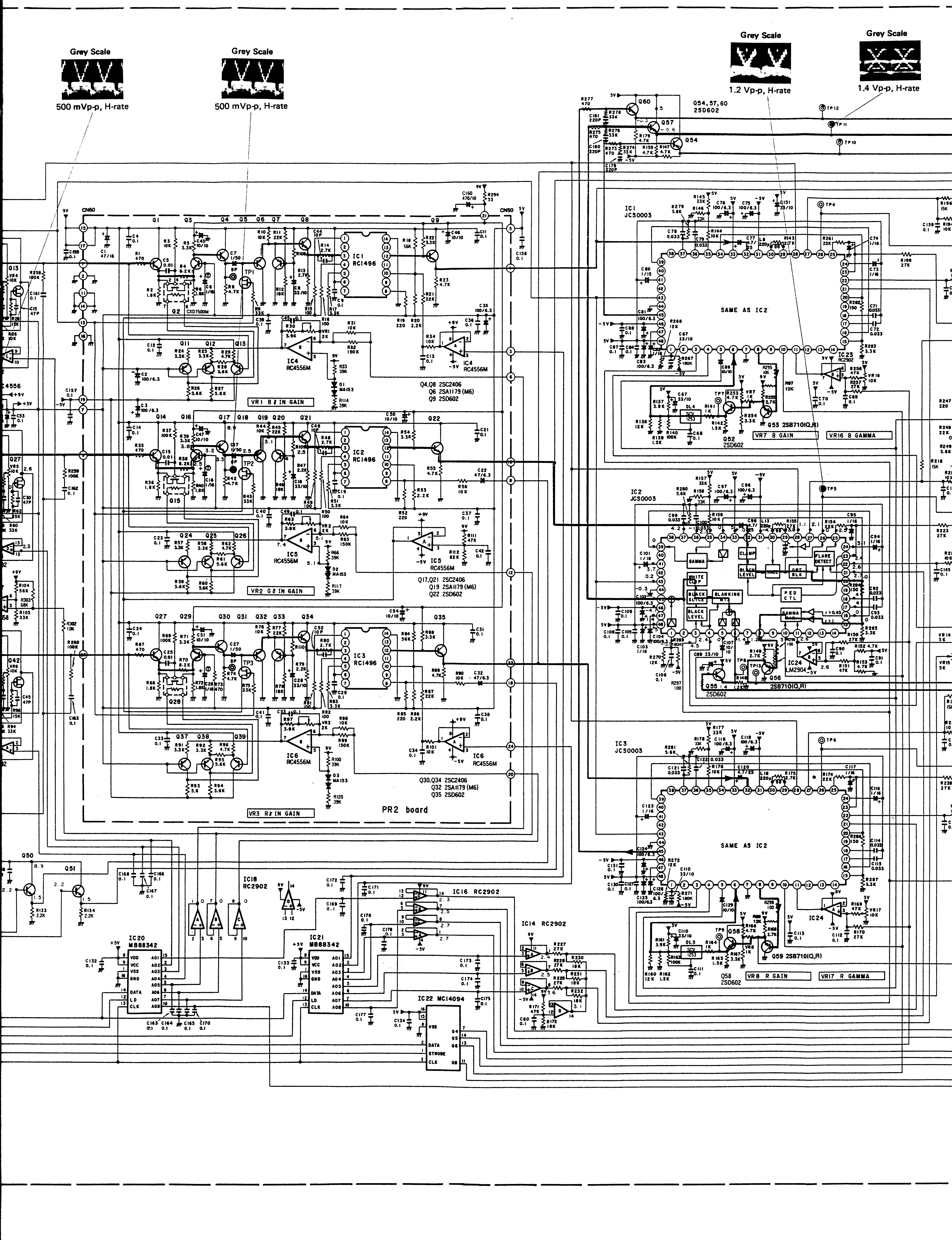
Soldered side view (B)

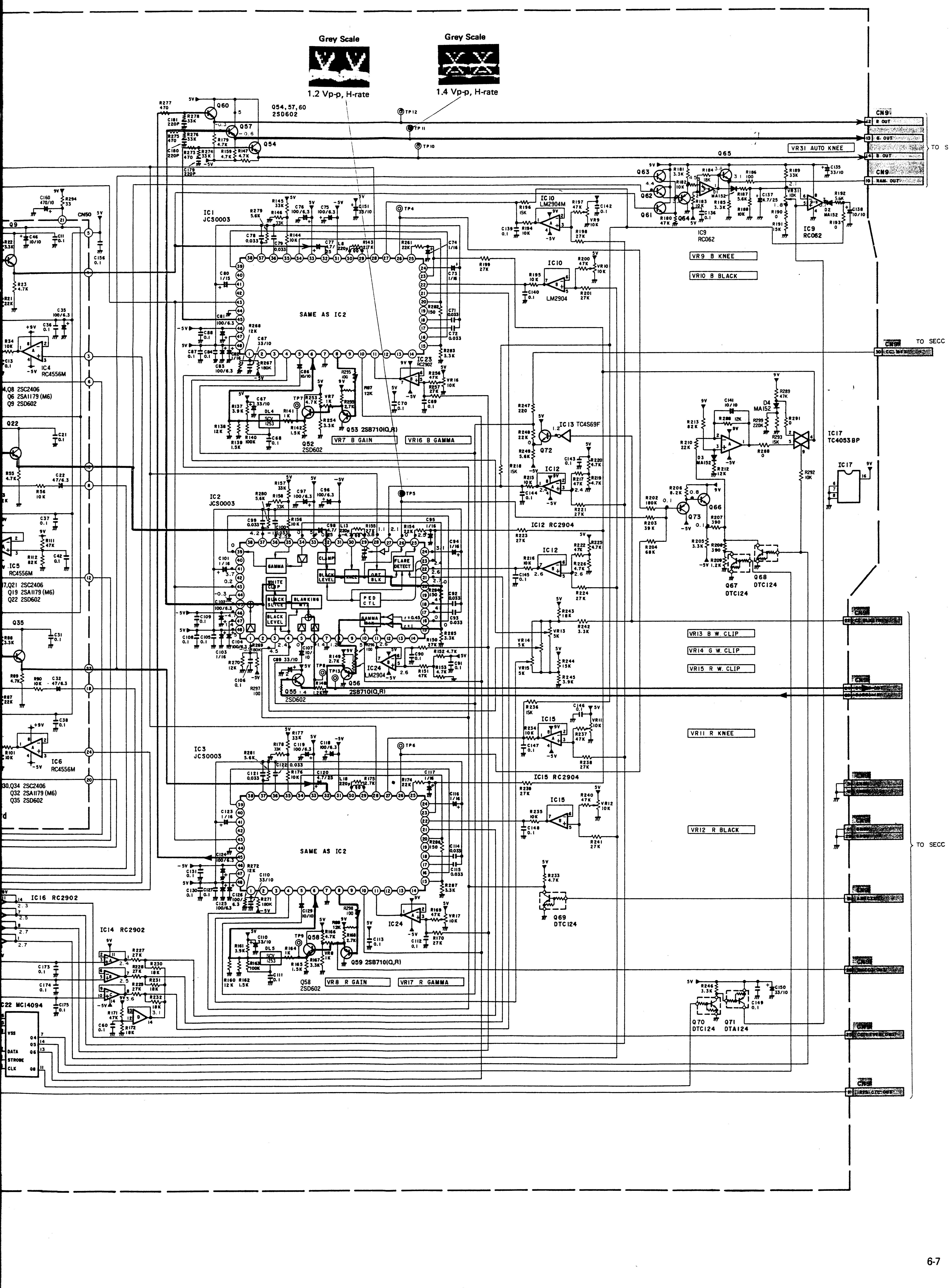



C
B
E
B C E
G
S
D
S
D
J00
G
Sub
NC Gd Gs NC
NC D S Sub
MA152WK
MA152WA
MA153
MA152A
RD□□□M
B
C
E
G
D
S
Sub
Gd
Gs

6.9 PR1/PR2 BOARDS SCHEMATIC DIAGRAM

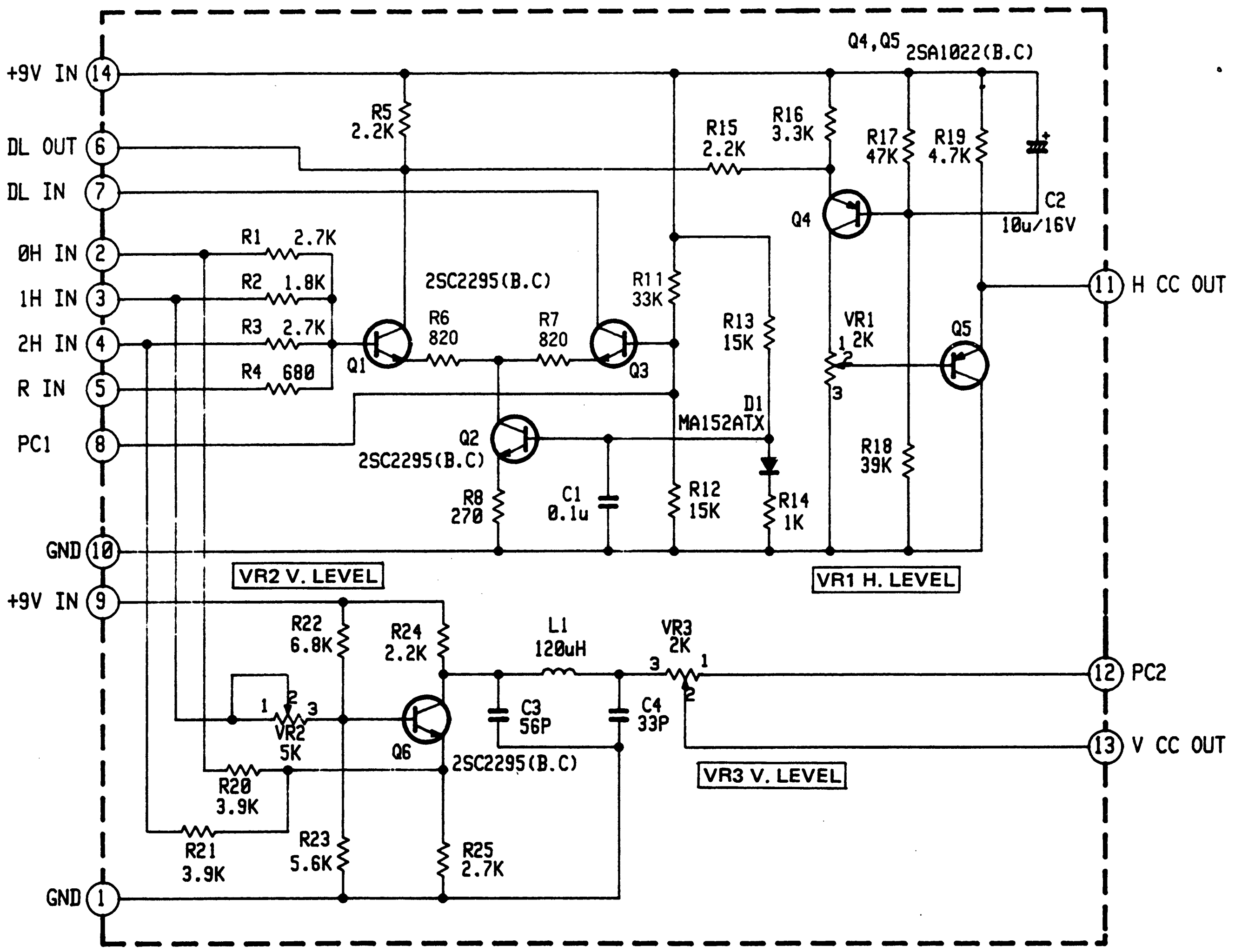

GRey Scale
180 mVp-p, H-rate
Grey Scale
500 mVp-p, H-rate
Grey Scale
500 mVp-p, H-rate
TO SECC
CN9
-5V IN
+5V IN
+5V IN
TO SECC
TO PS 2
AN51
+9V IN
TO ISB
CN1
IS B IN
IS B +9V
IS B GND
TO SECC
TO ISG
CN2
ISG IN
ISG +9V
ISG GND
TO SECC
TO ISR
CN3
ISR IN
ISR +9V
ISR GND
TO SECC
TO SECC
Q1 2SD602
Q8 2SD602
VR1 B IN GAIN
VR4 B BLACK BAL
IC4 RC4558
IC23 RC2902
IC7 RC4556
VR2 G IN GAIN
VR5 G BLACK BAL
Q22 2SD602
IC5
Q30 2SD602
Q37 2SD602
VR3 R IN GAIN
VR6 R BLACK BAL
RC4558
IC6
Q77 2SA1179(M6)
Q45 Q46 2SD602
Q47 2SD602
Q50
Q51
VR21 DY. V. SAW G
VR22 DY. V. SAW R
VR26 DY. V. PARA G
VR27 DY. V. PARA R
IC18 RC2902
IC20 MB88342
IC21 MB88342
CN60
IC1 RC1496
IC2 RC1496
IC3 RC1496
IC4 RC4556M
IC5 RC4556M
IC6 RC4556M
Q2 CXD7500M
VR1 B IN GAIN
VR2 G IN GAIN
VR3 R IN GAIN
PR2 board


Grey Scale
500 mVp-p, H-rate
Grey Scale
500 mVp-p, H-rate
Grey Scale
1.2 Vp-p, H-rate
Grey Scale
1.4 Vp-p, H-rate
Q54, 57, 60
2SD602
CN50
IC1
RC1496
IC2
RC1496
IC3
RC1496
IC4
RC4556M
IC5
RC4556M
IC6
RC4556M
CXD7500M
Q4,Q8 2SC2406
Q6 2SA1179 (M6)
Q9 2SD602
Q17,Q21 2SC2406
Q19 2SA1179 (M6)
Q22 2SD602
Q30,Q34 2SC2406
Q32 2SA1179 (M6)
Q35 2SD602
VR1 B IN GAIN
VR2 G IN GAIN
VR3 R IN GAIN
PR2 board
IC1
JCS0003
SAME AS IC2
IC23
RC2902
VR7 B GAIN
VR16 B GAMMA
Q53 2SB710(Q,R)
Q52
2SD602
IC2
JCS0003
GAMMA
CLAMP
FLARE DETECT
BLACK LEVEL
OPT BLK
WHITE CLIP
BLACK SLICE
BLANKING
PED CTL
BLACK LEVEL
GAMMA
IC24
LM2904
Q55
2SD602
Q56
2SB710(Q,R)
IC3
JCS0003
SAME AS IC2
IC24
VR8 R GAIN
VR17 R GAMMA
Q58
2SD602
Q59 2SB710(Q,R)
IC18
RC2902
IC20
MB88342
IC21
MB88342
IC16 RC2902
IC14 RC2902
IC22 MC14094
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13

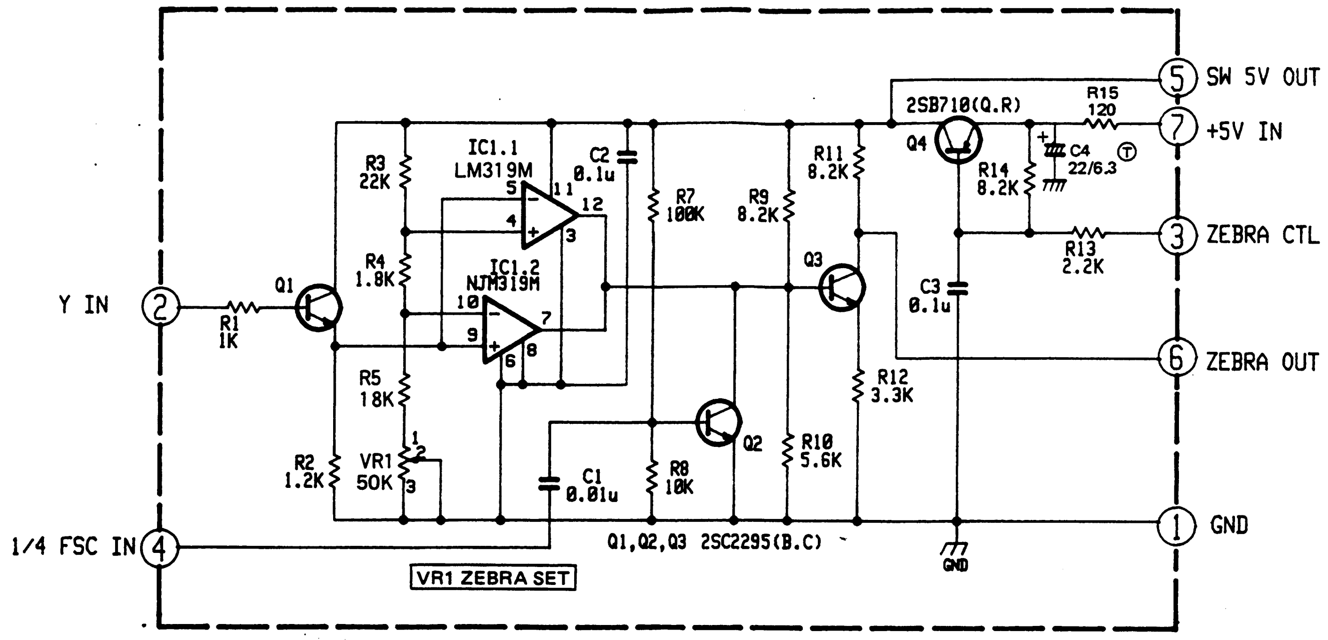

Grey Scale
1.2 Vp-p, H-rate
Grey Scale
1.4 Vp-p, H-rate
Q54,57,60
2SD602
Q60
Q57
Q54
TP12
TP11
TP10
CN9
R OUT
G OUT
B OUT
NAM. OUT
TO SEC
VR31 AUTO KNEE
Q65
Q63
Q62
Q61
Q64
IC9
RC062
IC10
LM2904M
LM2904
IC1
JCS0003
SAME AS IC2
TP4
IC23
RC2902
VR9 B KNEE
VR10 B BLACK
CN50
IC4
RC4556M
Q4,Q8 2SC2406
Q6 2SA1179 (M6)
Q9 2SD602
Q22
TP7
DL4
Q53 2SB710(Q,R)
Q52
2SD602
VR7 B GAIN
VR16 B GAMMA
TO SECC
IC13 TC4S69F
Q72
IC17
TC4053BP
D4
MA152
D3
MA152
IC12
IC12 RC2904
Q73
Q66
Q67
DTC124
Q68
DTC124
IC2
JCS0003
TP5
GAMMA
CLAMP
BLACK LEVEL
KNEE
ORT BLK
FLARE DETECT
WHITE CLIP
BLACK SLICE
BLANKING MIX
BLACK LEVEL
PED CTL
GAMMA
IC5
RC4556M
Q7,Q21 2SC2406
Q19 2SA1179 (M6)
Q22 2SD602
Q35
TP8
TP13
Q55
2SD602
Q56
2SB710(Q,R)
IC24
LM2904
VR13 B W. CLIP
VR14 G W. CLIP
VR15 R W. CLIP
VR13
VR14
VR15
IC15
VR11 R KNEE
IC15 RC2904
IC6
RC4556M
Q30,Q34 2SC2406
Q32 2SA1179 (M6)
Q35 2SD602
IC3
JCS0003
TP6
SAME AS IC2
VR12 R BLACK
Q69
DTC124
IC16 RC2902
IC14 RC2902
IC24
TP9
Q58
2SD602
Q59 2SB710(Q,R)
DL5
VR8 R GAIN
VR17 R GAMMA
IC22 MC14094
VSS
DATA
STROBE
CLK
Q70
DTC124
Q71
DTA124
TO SECC

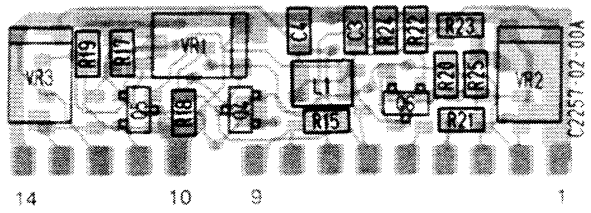
6.10 SECC BOARD CBMs

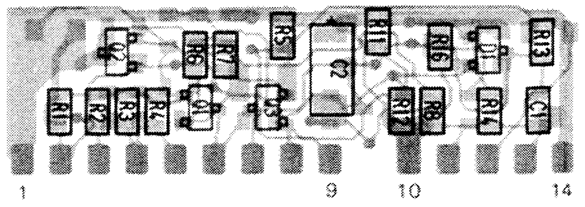
● CONTOUR GEN CBM [CBMC2257-02-00A] (CBM1)

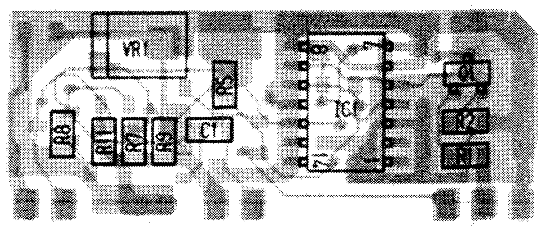

+9V IN 14
DL OUT 6
DL IN 7
0H IN 2
1H IN 3
2H IN 4
R IN 5
PC1 8
GND 10
+9V IN 9
GND 1
H CC OUT 11
PC2 12
V CC OUT 13
Q4,Q5 2SA1022(B.C)
R1 2.7K
R2 1.8K
R3 2.7K
R4 680
R5 2.2K
R6 820
R7 820
R8 270
R11 33K
R12 15K
R13 15K
R14 1K
R15 2.2K
R16 3.3K
R17 47K
R18 39K
R19 4.7K
R20 3.9K
R21 3.9K
R22 6.8K
R23 5.6K
R24 2.2K
R25 2.7K
C1 0.1u
C2 10u/16V
C3 56P
C4 33P
L1 120uH
D1 MA152ATX
2SC2295(B.C)
Q1
Q2
Q3
Q4
Q5
Q6
VR1 2K
VR2 5K
VR3 2K
VR1 H. LEVEL
VR2 V. LEVEL
VR3 V. LEVEL

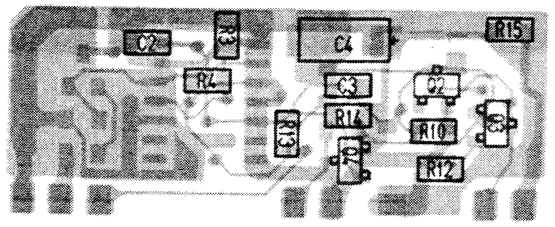
● ZEBRA CBM [CBMC2257-03-00A] (CBM2)


SW 5V OUT 5
+5V IN 7
ZEBRA CTL 3
Y IN 2
ZEBRA OUT 6
GND 1
1/4 FSC IN 4
IC1.1 LM319M
IC1.2 NJM319M
2SB710(Q.R)
Q1,Q2,Q3 2SC2295(B.C)
R1 1K
R2 1.2K
R3 22K
R4 1.8K
R5 18K
R7 100K
R8 10K
R9 8.2K
R10 5.6K
R11 8.2K
R12 3.3K
R13 2.2K
R14 8.2K
R15 120
C1 0.01u
C2 0.1u
C3 0.1u
C4 22/6.3
VR1 50K
VR1 ZEBRA SET
GND


VR3
R19
R17
VR1
C4
C3
R22
R24
R23
R20
R25
VR2
L1
R15
R18
R21
C2257-02-00A
14
10
9
1


R5
R11
R16
R13
C2
R1
R2
R3
R4
R6
R7
R12
R8
R14
C1
1
9
10
14

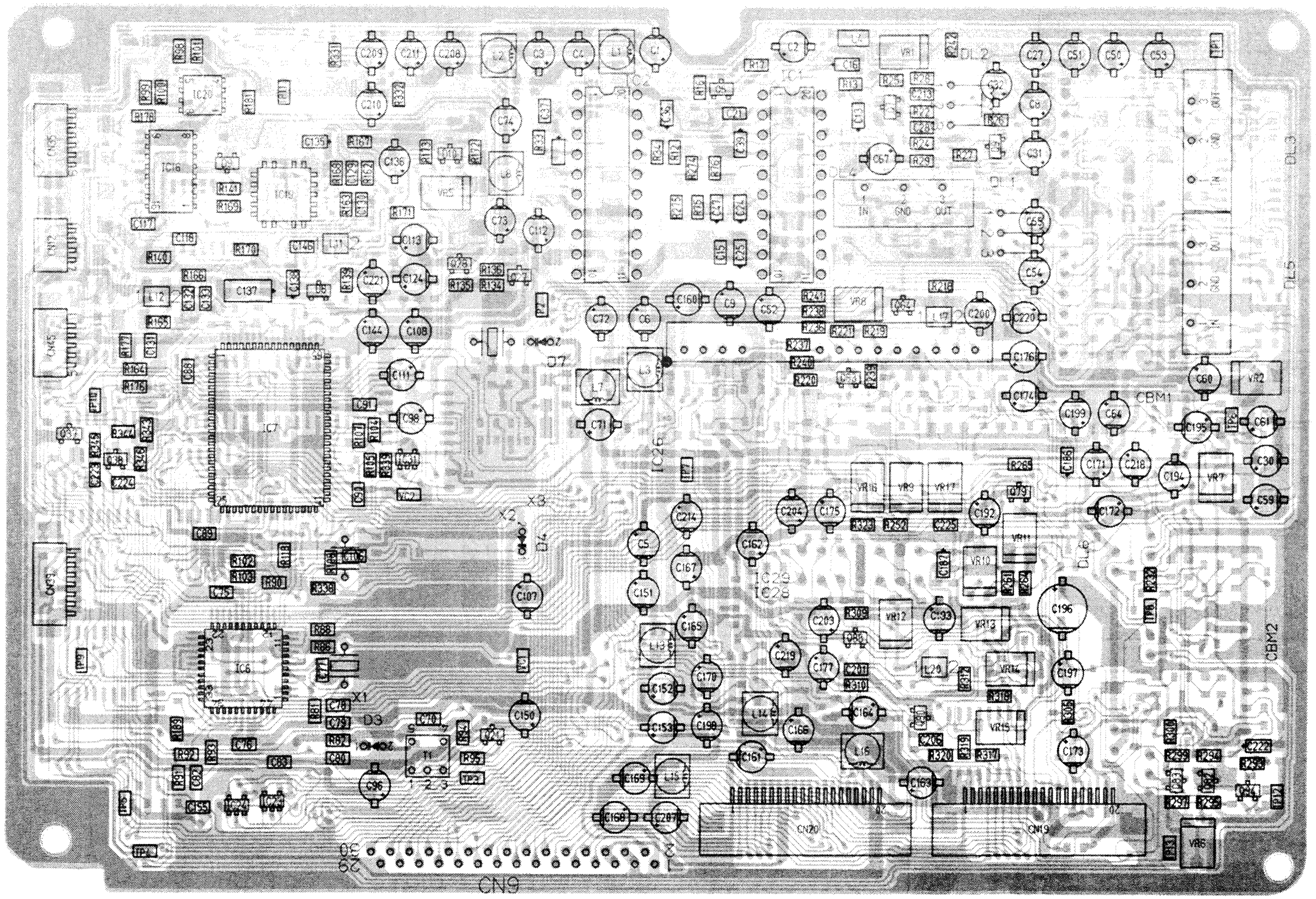

VR1
R5
IC1
C1
R8
R1
R7
R9
R2
R1

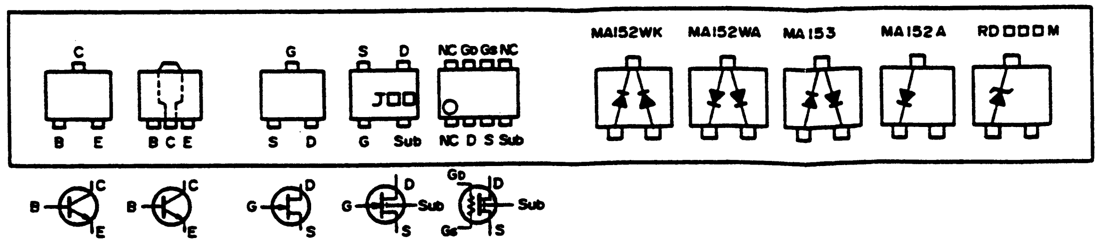

C2
R3
C4
R15
R4
C3
R14
R10
R12
R13

6.11 SECC CIRCUIT BOARDS

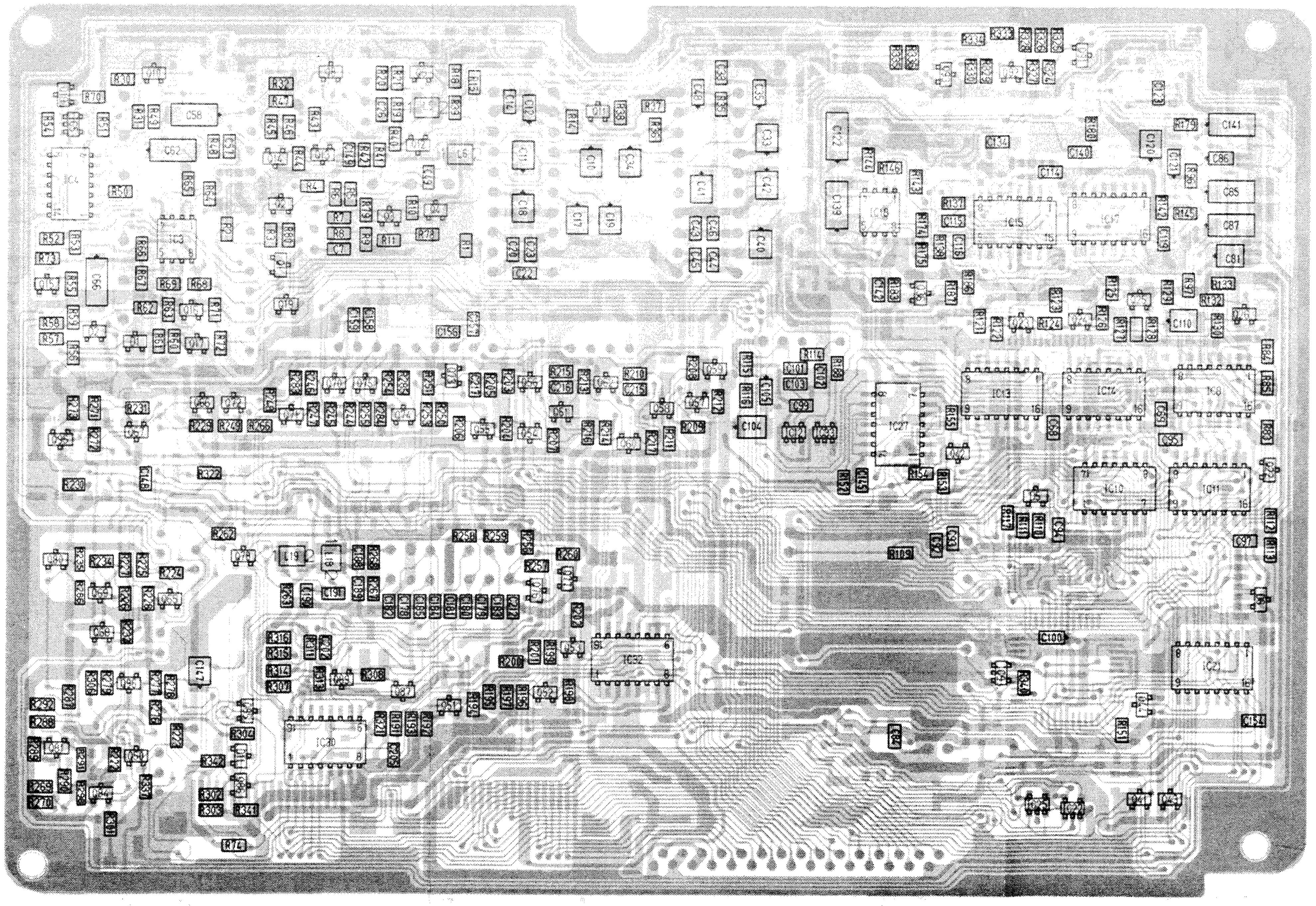
● SECC board

Parts side view (A)


CN9
CN19
CN20
IC7
IC6
IC16
IC20
IC1
IC28
IC29
IC36
CBM1
CBM2
DL1
DL2
DL3
DL5
DL6
VR1
VR2
VR5
VR6
VR7
VR8
VR9
VR10
VR11
VR12
VR13
VR14
VR15
VR16
VR17
X1
X2
X3
T1
D3
D4
D7
L3
L7
L13
L14
L15
L16
C196
C197
C150
C107
C137

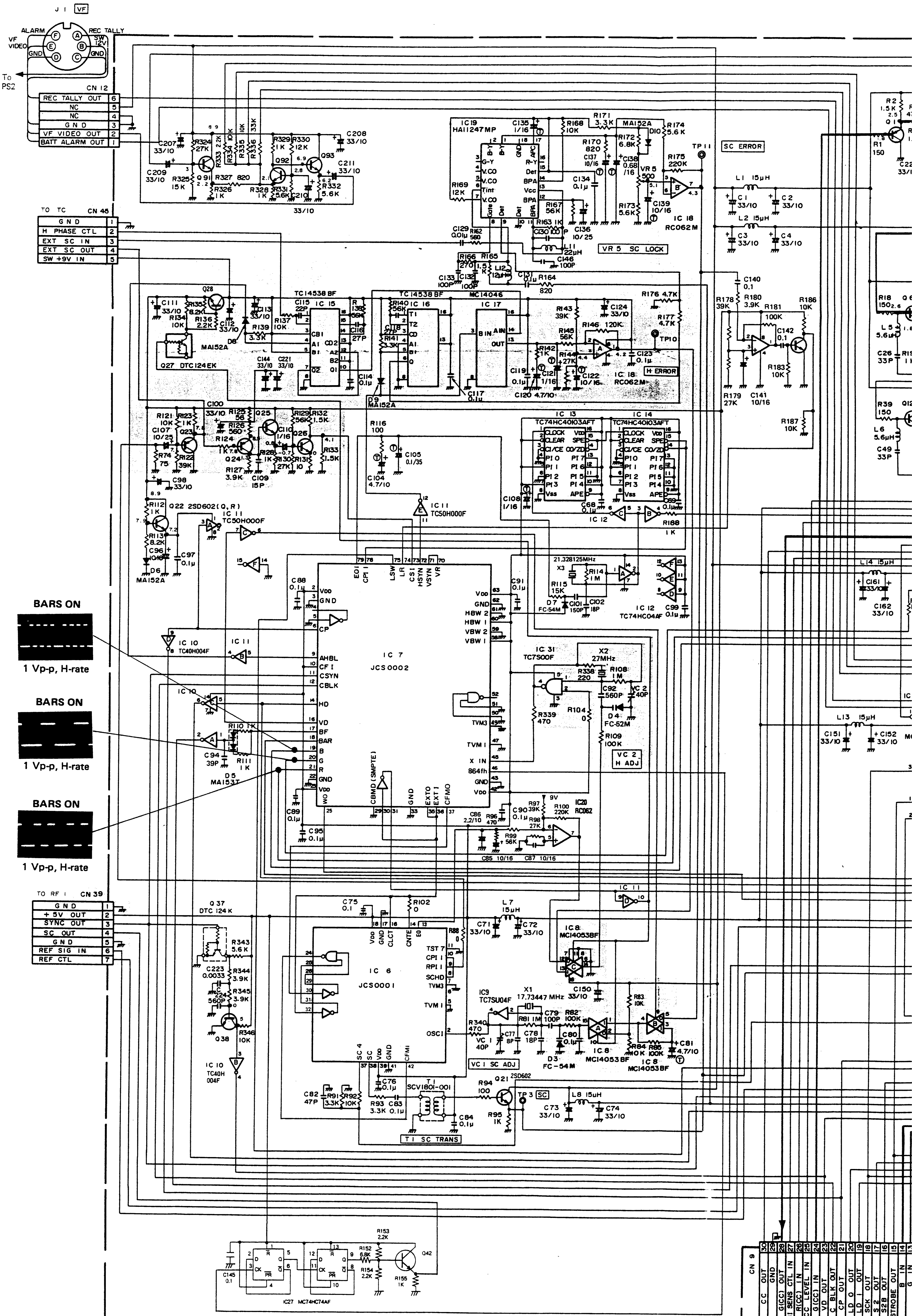

C
B
E
B C E
G
S
D
S
D
G
Sub
J
NC
Gd
Gs
NC
NC
D
S
Sub
MA152WK
MA152WA
MA153
MA152A
RD□□□M
B
C
E
B
C
E
G
D
S
G
D
Sub
S
Gd
D
Sub
Gs
S

Soldered side view (B)

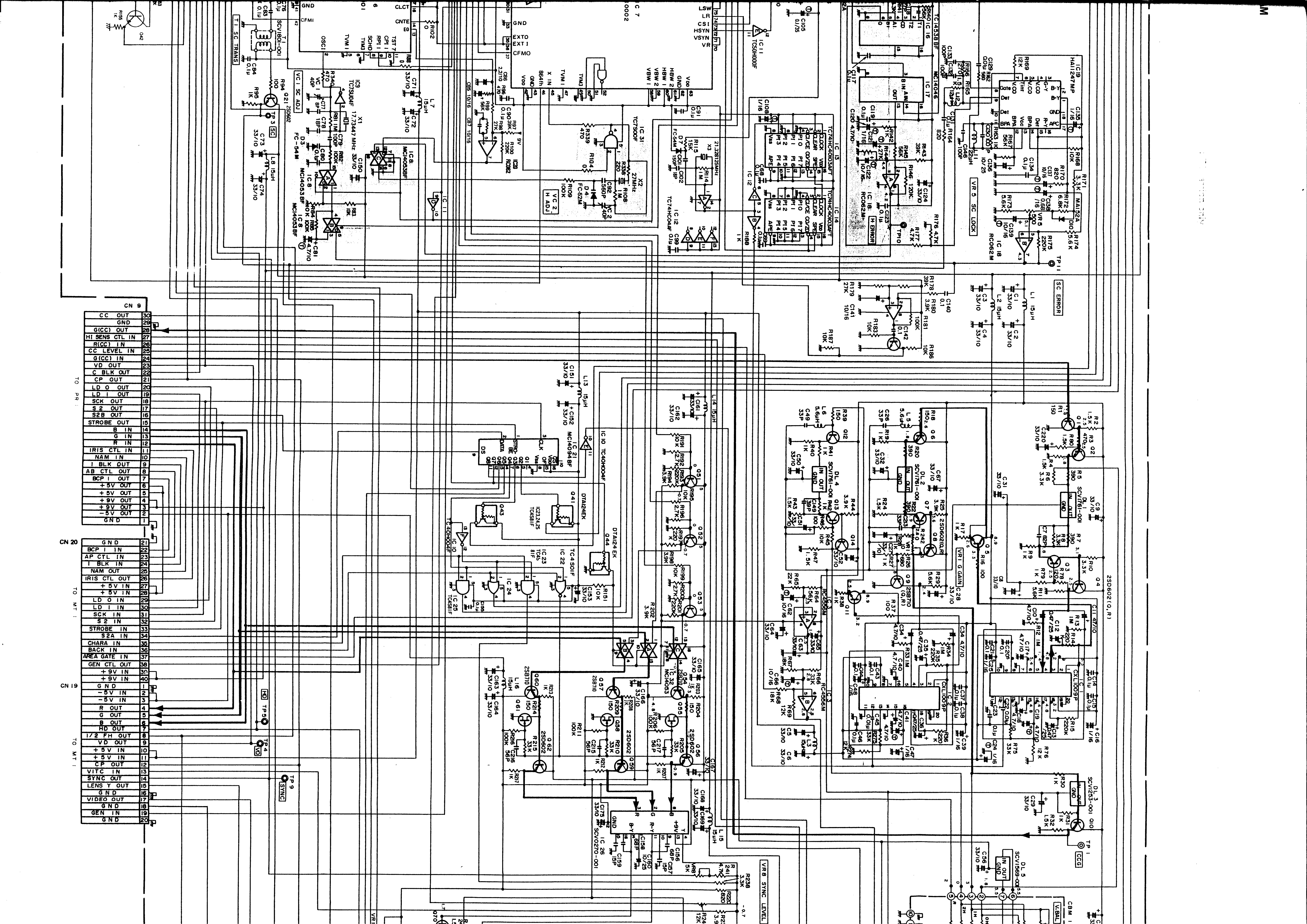


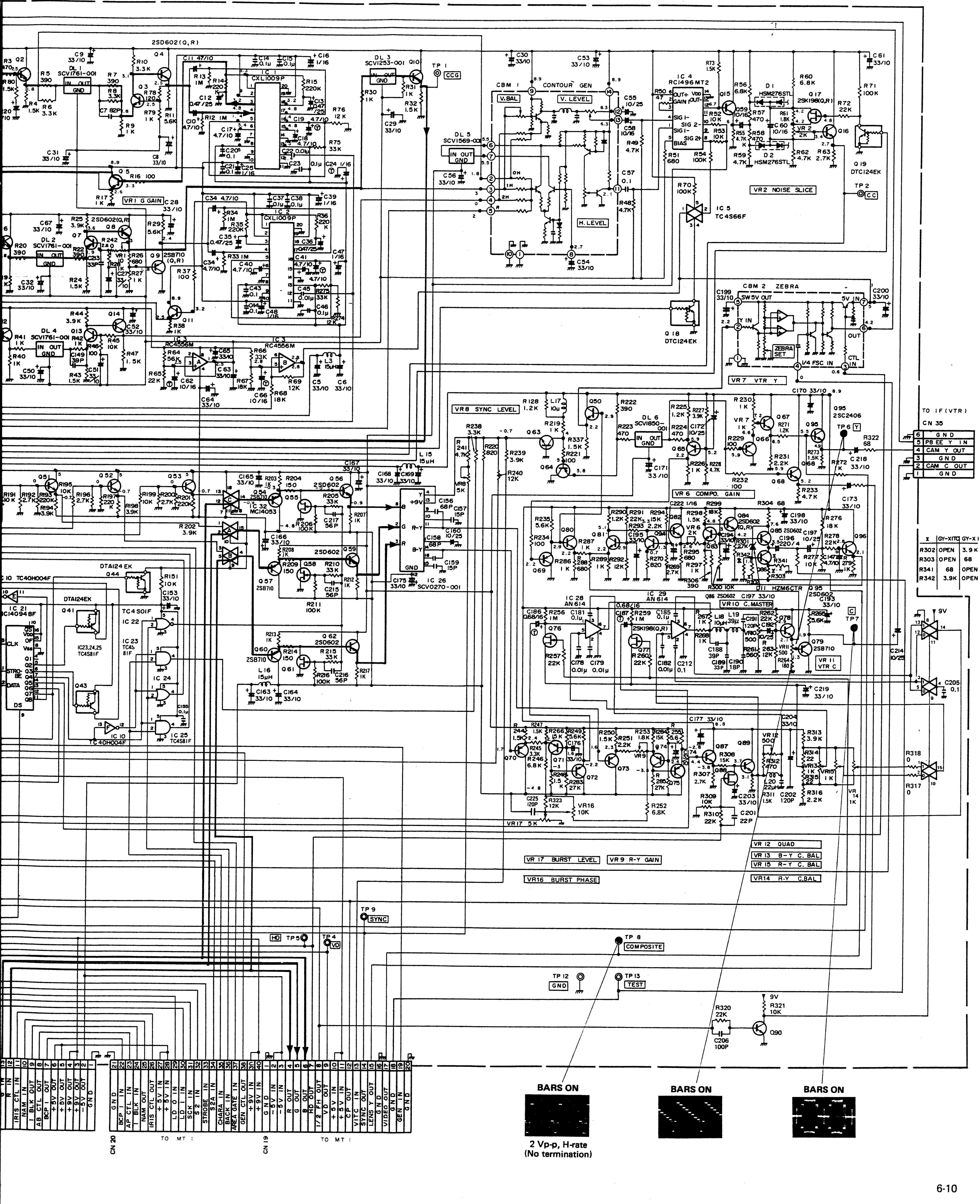
6-9 6-9

6.12 SECC BOARD SCHEMATIC DIAGRAM



J 1 VF
ALARM
REC TALLY
SW 12V
VF VIDEO
GND
To PS2
CN 12
REC TALLY OUT 6
NC 5
NC 4
GND 3
VF VIDEO OUT 2
BATT ALARM OUT 1
TO TC CN 45
GND 1
H PHASE CTL 2
EXT SC IN 3
EXT SC OUT 4
SW +9V IN 5
BARS ON
1 Vp-p, H-rate
BARS ON
1 Vp-p, H-rate
BARS ON
1 Vp-p, H-rate
TO RF 1 CN 39
GND 1
+5V OUT 2
SYNC OUT 3
SC OUT 4
GND 5
REF SIG IN 6
REF CTL 7
IC19 HA11247MP
IC 18 RC062M
VR 5 SC LOCK
SC ERROR
TP 11
TC14538BF IC 15
TC14538BF IC 16
MC14046 IC 17
IC 18 RC062M
H ERROR
TP10
Q27 DTC124EK
Q28
MA152A
D8
D9 MA152A
D10
Q22 2SD602(Q, R)
D6 MA152A
IC 13 TC74HC40103AFT
IC 14 TC74HC40103AFT
IC 12 TC74HC04AF
IC 11 TC50H000F
IC 10 TC40H004F
IC 7 JCS0002
21.328125MHz X3
D7 FC-54M
IC 31 TC7S00F
X2 27MHz
D4 FC-52M
VC 2 H ADJ
IC20 RC062
D5 MA153
Q 37 DTC 124 K
Q38
IC 10 TC40H 004F
IC 6 JCS0001
IC8 MC14053BF
IC9 TC7SU04F
X1 17.73447 MHz
D3 FC-54M
VC 1 SC ADJ
Q21 2SD602
TP 3 SC
T1 SCV1801-001
T1 SC TRANS
IC27 MC74HC74AF
Q42
CN 9
CC OUT 30
GND 29
G(CC) OUT 28
HI SENS CTL IN 27
R(CC) IN 26
CC LEVEL IN 25
G(CC) IN 24
VD OUT 23
C BLK OUT 22
CP OUT 21
LD 0 OUT 20
LD 1 OUT 19
SCK OUT 18
S2 OUT 17
S2B OUT 16
STROBE OUT 15
B IN 14
G IN 13
TO PR


CN 9
30 CC OUT
29 GND
28 G(CC) OUT
27 HI SENS CTL IN
26 R(CC) IN
25 CC LEVEL IN
24 G(CC) IN
23 VD OUT
22 C BLK OUT
21 CP OUT
20 LD 0 OUT
19 LD 1 OUT
18 SCK OUT
17 S 2 OUT
16 S2B OUT
15 STROBE OUT
14 B IN
13 G IN
12 R IN
11 IRIS CTL IN
10 NAM IN
9 I BLK OUT
8 AB CTL OUT
7 BCP I OUT
6 +5V OUT
5 +5V OUT
4 +9V OUT
3 +9V OUT
2 −5V OUT
1 GND
TO PR
CN 20
21 GND
22 BCP I IN
23 AP CTL IN
24 I BLK IN
25 NAM OUT
26 IRIS CTL OUT
27 +5V IN
28 +5V IN
29 LD 0 IN
30 LD I IN
31 SCK IN
32 S 2 IN
33 STROBE IN
34 S2A IN
35 CHARA IN
36 BACK IN
37 AREA GATE IN
38 GEN CTL OUT
39 +9V IN
40 +9V IN
TO MT I
CN 19
1 GND
2 −5V IN
3 −5V IN
4 R OUT
5 G OUT
6 B OUT
7 HD OUT
8 1/2 FH OUT
9 VD OUT
10 +5V IN
11 +5V IN
12 CP OUT
13 VITC IN
14 SYNC OUT
15 LENS Y OUT
16 GND
17 VIDEO OUT
18 GND
19 GEN IN
20 GND
TO MT I
TP 5 HD
TP 4 VD
TP 9 SYNC
TP 1 CCG
TP 11
TP 10
T 1 SC TRANS
VC 1 SC ADJ
VC 2 H ADJ
VR 5 SC LOCK
H ERROR
SC ERROR
VR 1 G GAIN
VR 8 SYNC LEVEL
V.BAL
IC 7
IC 11 TC50H000F
IC 31 TC7S00F
IC 13 TC74HC4040AFT
IC 14 TC74HC4040AFT
IC 12 TC74HC04F
IC 16 TC14538BF
IC 17 MC14046
IC 18 RC062M
IC 19 HA11247MP
IC 8 MC14053BF
IC 9 TC7SU04F
IC 10 TC40H004F
IC 21 MC14094BF
IC 22 TC4S01F
IC 23, 24, 25 TC4S81F
IC 26 SCV0270-001
IC 32 MC14053
IC 3 RC4556M
IC 1 CXL1009P
IC 2 CXL1009P
DL 1 SCV1761-001
DL 2 SCV1761-001
DL 3 SCV1253-001
DL 4 SCV1761-001
DL 5 SCV1569-001
X1 17.734475 MHz
X2 27MHz
X3 21.328125MHz
Q41 DTA124EK
Q44 DTA124EK
2SD602(Q,R)
2SB710
CBM 1

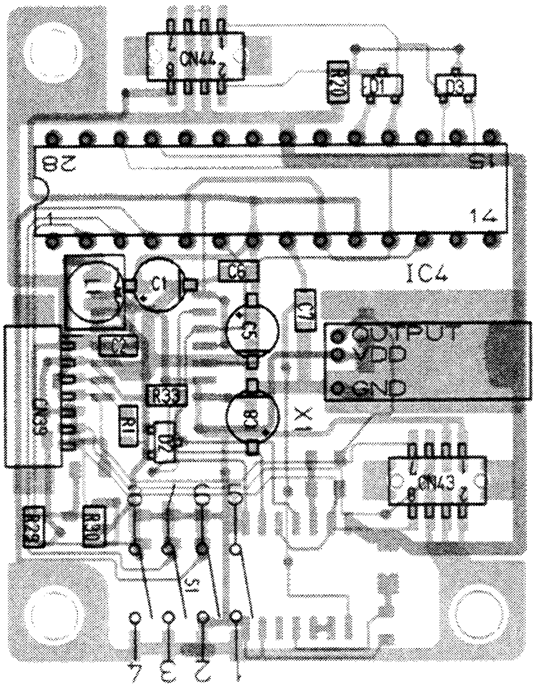

2SD602(Q,R)
DL 1 SCV1761-001
IC 1 CXL1009P
IC 2 CXL1009P
DL 2 SCV1761-001
DL 3 SCV1253-001
DL 4 SCV1761-001
DL 5 SCV1569-001
DL 6 SCV1850-001
TP 1 CCG
VR1 G GAIN
IC 3 RC4556M
CBM 1 CONTOUR GEN
V.BAL
V. LEVEL
H. LEVEL
IC 4 RC1496MT2
IC 5 TC4S66F
VR2 NOISE SLICE
TP 2 CC
Q 18 DTC124EK
Q 19 DTC124EK
CBM 2 ZEBRA
ZEBRA SET
1/4 FSC IN
VR7 VTR Y
VR8 SYNC LEVEL
VR 6 COMPO. GAIN
IC 26 SCV0270-001
IC 32 MC14053
IC 21 IC14094BF
IC 10 TC40H004F
IC 22 TC4S01F
IC 23 TC4S81F
IC 24
IC 25 TC4S81F
IC 28 AN 614
IC 29 AN 614
VR10 C.MASTER
VR 11 VTR C
D11 HZM6CTR
TP 6 Y
TP 7 C
TO IF(VTR)
CN 35
6 GND
5 PB EE Y IN
4 CAM Y OUT
3 GND
2 CAM C OUT
1 GND
VR 12 QUAD
VR 13 B-Y C. BAL
VR 15 R-Y C. BAL
VR14 R-Y C.BAL
VR 17 BURST LEVEL
VR9 R-Y GAIN
VR16 BURST PHASE
TP 9 SYNC
HD TP5
TP 4 VD
TP 8 COMPOSITE
TP 12 GND
TP 13 TEST
Q90
CN 20
TO MT I
CN 19
TO MT I
IRIS CTL IN
NAM IN
I BLK OUT
AB CTL OUT
BCP I OUT
+5V OUT
+5V OUT
+9V OUT
+9V OUT
-5V OUT
GND
GND
BCP I IN
AP CTL IN
I BLK IN
NAM OUT
IRIS CTL OUT
+5V IN
+5V IN
LD 0 IN
LD 1 IN
SCK IN
S2 IN
STROBE IN
S2A IN
CHARA IN
BACK IN
AREA GATE IN
GEN CTL OUT
+9V IN
+9V IN
GND
-5V IN
-5V IN
R OUT
G OUT
B OUT
HD OUT
1/2 FH OUT
VD OUT
+5V IN
+5V IN
CP OUT
VITC IN
SYNC OUT
LENS Y OUT
GND
VIDEO OUT
GND
GEN IN
GND
BARS ON
BARS ON
BARS ON
2 Vp-p, H-rate
(No termination)

X	GY-X1TC	GY-X1
R302	OPEN	3.9K
R303	OPEN	68
R341	68	OPEN
R342	3.9K	OPEN

6.13 RF-1/RF-2 CIRCUIT BOARDS

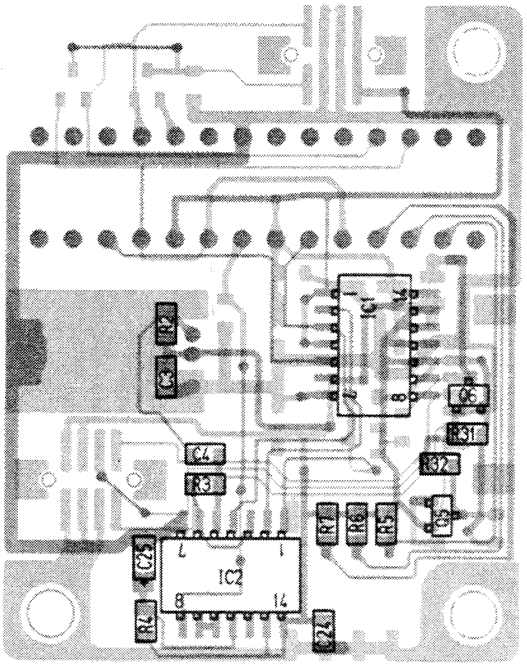
• RF-1 board

parts side view (A)



CN44
R20
D1
D3
28
15
1
14
IC4
C1
C6
C7
C5
C2
OUTPUT
VDD
GND
R33
R1
D2
C8
X1
CN39
CN43
R29
R30
S1
4
3
2
1

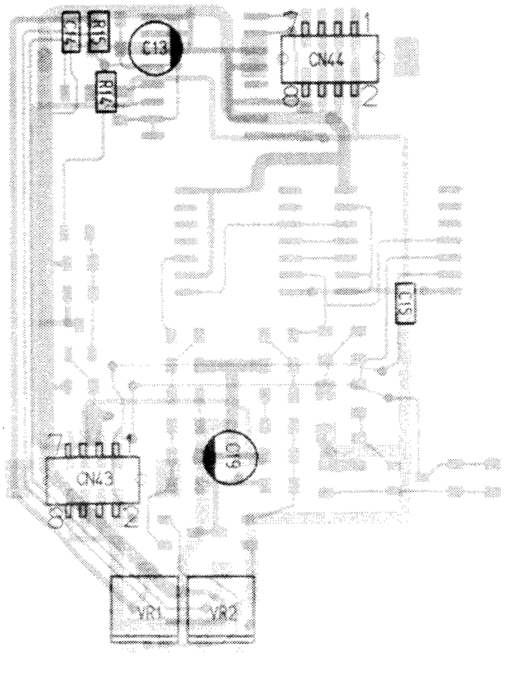
Soldered side view (B)



IC1
R2
C3
Q6
R31
R32
C4
R3
R7
R6
R5
Q5
C25
IC2
R4
C24
1
7
8
14

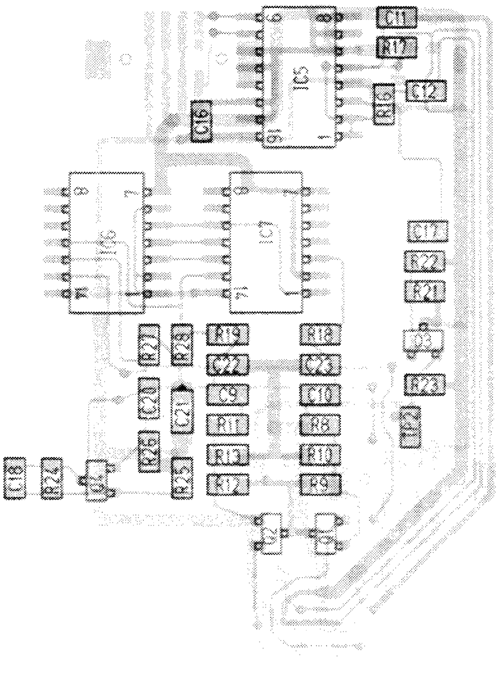
• RF-2 board

parts side view (A)



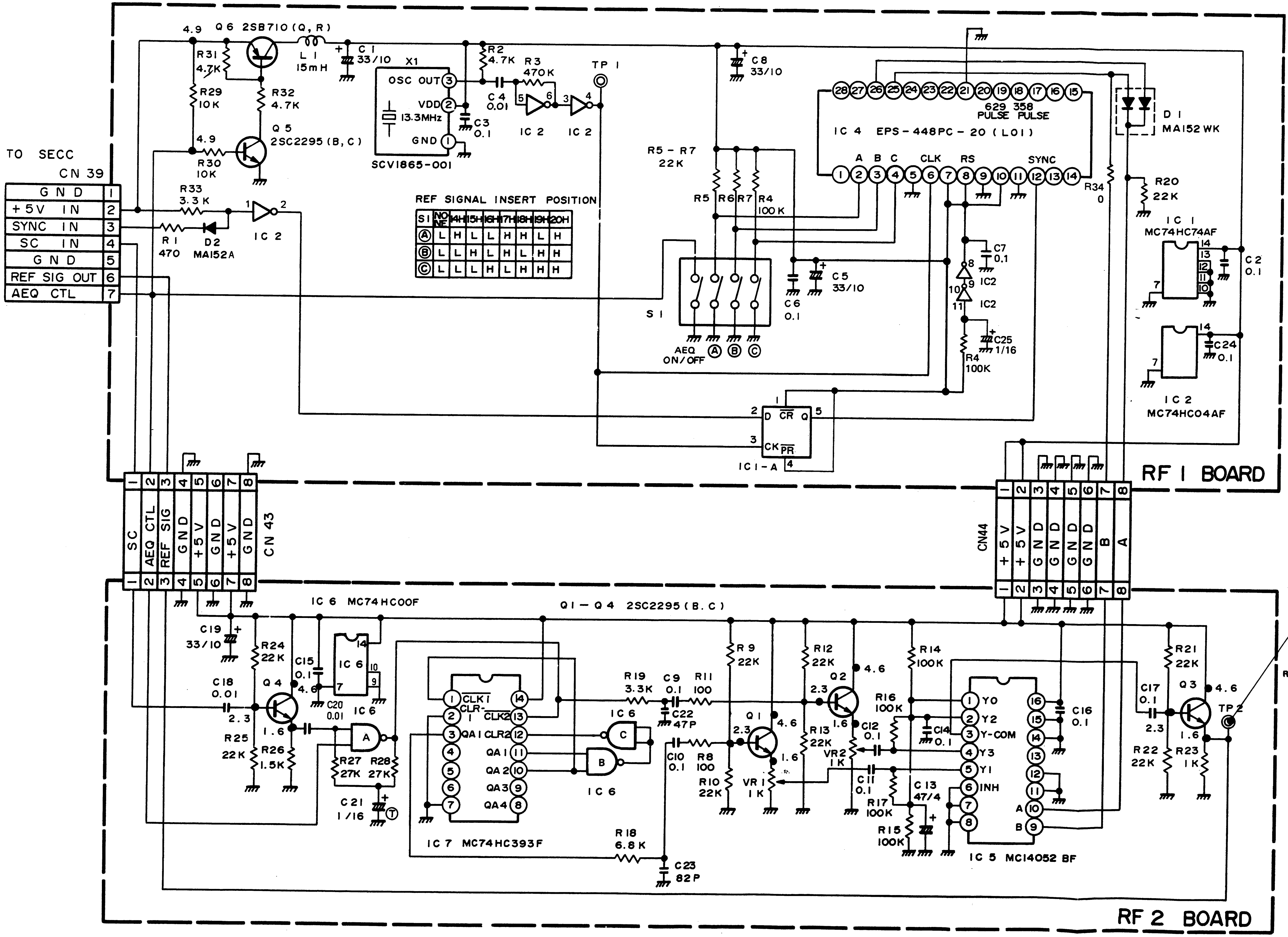
C14
R15
C13
R14
CN44
L1
CN43
C19
VR1
VR2

Soldered side view (B)



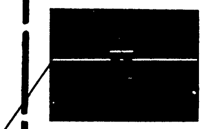
IC5
C11
R17
R16
C12
C16
IC6
IC7
C17
R22
R21
R27
R28
R19
R18
C22
C23
D3
C20
C21
C9
C10
R23
R26
R11
R8
TP1
R25
R13
R10
C18
R24
Q4
R12
R9
Q2
Q1

6.14 RF1/RF2 BOARD SCHEMATIC DIAGRAM


TO SECC
CN 39
GND
+5V IN
SYNC IN
SC IN
GND
REF SIG OUT
AEQ CTL
Q6 2SB710 (Q, R)
4.9
R31 4.7K
R29 10K
R32 4.7K
Q5 2SC2295 (B, C)
R30 10K
R33 3.3K
R1 470
D2 MA152A
IC 2
L1 15mH
C1 33/10
X1
OSC OUT
VDD
GND
13.3MHz
SCV1865-001
C3 0.1
R2 4.7K
R3 470K
C4 0.01
TP 1
C8 33/10
R5 – R7 22K
R5 R6 R7 R4 100K
C6 0.1
C5 33/10
S1
AEQ ON/OFF Ⓐ Ⓑ Ⓒ
IC 4 EPS-448PC-20 (L01)
629 PULSE
358 PULSE
A B C CLK RS SYNC
D1 MA152WK
R34 0
R20 22K
C7 0.1
C25 1/16
R4 100K
IC1-A
D CR Q CK PR
IC 1 MC74HC74AF
C2 0.1
C24 0.1
IC 2 MC74HC04AF
RF 1 BOARD
CN 43
SC AEQ CTL REF SIG GND +5V GND +5V GND
CN44
+5V +5V GND GND GND GND B A
IC 6 MC74HC00F
Q1 – Q4 2SC2295 (B.C)
C19 33/10
R24 22K
C15 0.1
C18 0.01
Q4
R25 22K
R26 1.5K
C20 0.01
R27 27K
R28 27K
C21 1/16
IC 7 MC74HC393F
CLK1 CLR-1 QA1 CLR2 QA1 QA2 QA3 QA4 CLK2
R19 3.3K
C9 0.1
R11 100
C22 47P
C10 0.1
R8 100
R10 22K
R18 6.8K
C23 82P
R9 22K
Q1
VR1 1K
R12 22K
Q2
R13 22K
VR2 1K
C12 0.1
C11 0.1
R16 100K
R17 100K
R15 100K
C13 47/4
R14 100K
C14 0.1
IC 5 MC14052BF
Y0 Y2 Y-COM Y3 Y1 INH A B
C16 0.1
C17 0.1
R21 22K
Q3
R22 22K
R23 1K
TP 2
RF 2 BOARD

REF SIGNAL INSERT POSITION

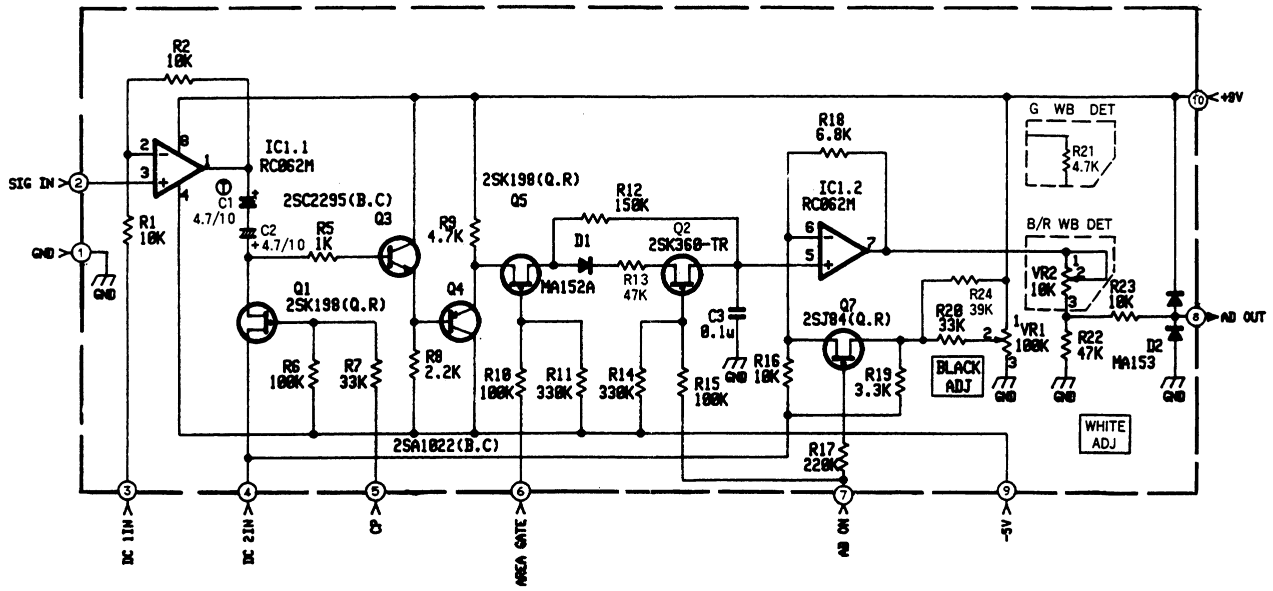
S1	NONE	14H	15H	16H	17H	18H	19H	20H
Ⓐ	L	H	L	L	H	H	L	H
Ⓑ	L	L	H	L	H	L	H	H
Ⓒ	L	L	L	H	L	H	H	H



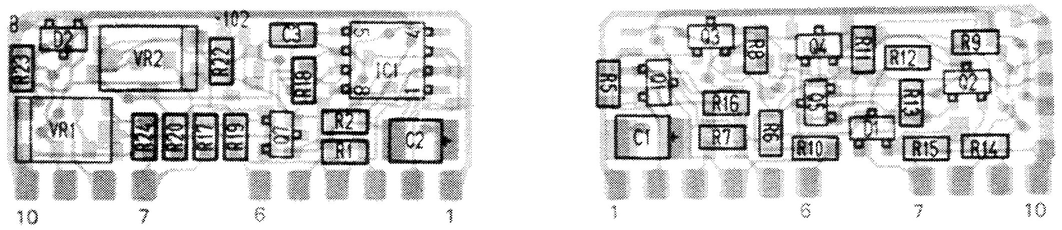
REFERENCE SIGNAL
17H 0.286 Vp-p

6.15 CP BOARD CBM

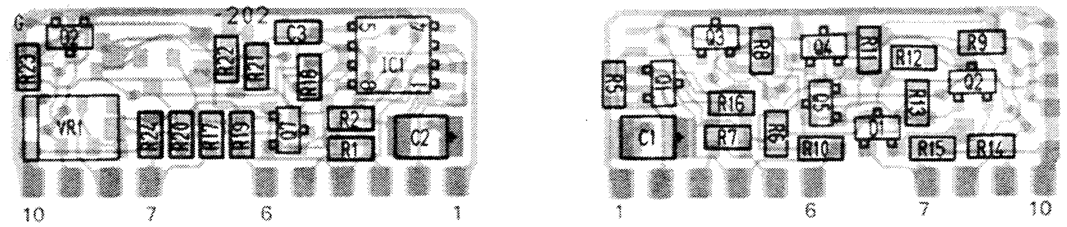
- ● B WB DET CBM [CBMC2257-04-01A] (CBM1)
- ● G WB DET CBM [CBMC2257-04-02] (CBM2)
- ● R WB DET CBM [CBMC2257-04-03A] (CBM3)


R2 10K
IC1.1 RC062M
C1 4.7/10
C2 4.7/10
R1 10K
R5 1K
2SC2295(B.C) Q3
Q1 2SK198(Q.R)
R6 100K
R7 33K
Q4
R8 2.2K
R9 4.7K
2SA1022(B.C)
2SK198(Q.R) Q5
R12 150K
D1
MA152A
R13 47K
Q2 2SK360-TR
C3 0.1u
R10 100K
R11 330K
R14 330K
R15 100K
R18 6.8K
IC1.2 RC062M
Q7 2SJ84(Q.R)
R16 10K
R19 3.3K
R17 220K
R24 39K
R20 33K
VR1 100K
BLACK ADJ
G WB DET
R21 4.7K
B/R WB DET
VR2 10K
R23 10K
R22 47K
D2 MA153
WHITE ADJ
SIG IN 2
GND 1
GND
10 +9V
8 AD OUT
3 DC 1IN
4 DC 2IN
5 CP
6 AREA GATE
7 AD ON
9 -5V

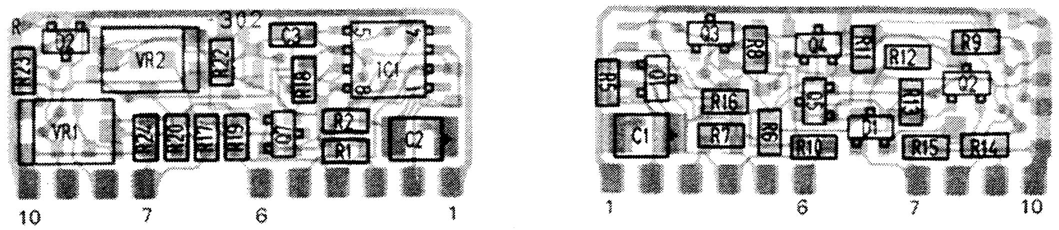
● B WB DET CBM


B
-102
Q2
VR2
R23
R22
C3
R18
IC1
VR1
R24
R20
R17
R19
Q7
R2
R1
C2
10
7
6
1
Q3
R8
Q4
R11
R12
R9
R5
Q1
R16
Q5
R13
Q2
C1
R7
R6
R10
D1
R15
R14
1
6
7
10

● G WB DET CBM

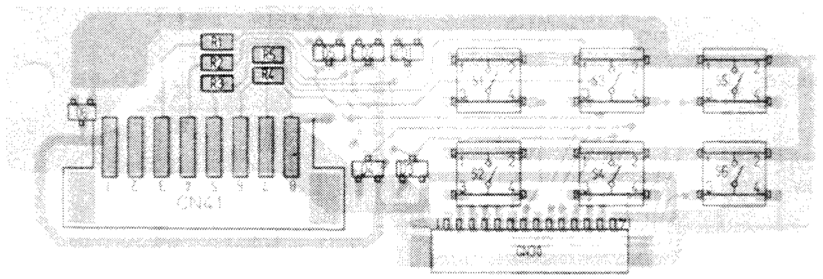

G
202
Q2
R23
R22
R21
C3
R18
IC1
VR1
R24
R20
R17
R19
Q7
R2
R1
C2
10
7
6
1
Q3
R8
Q4
R11
R12
R9
R5
Q1
R16
Q5
R13
Q2
C1
R7
R6
R10
D1
R15
R14
1
6
7
10

● R WB DET CBM

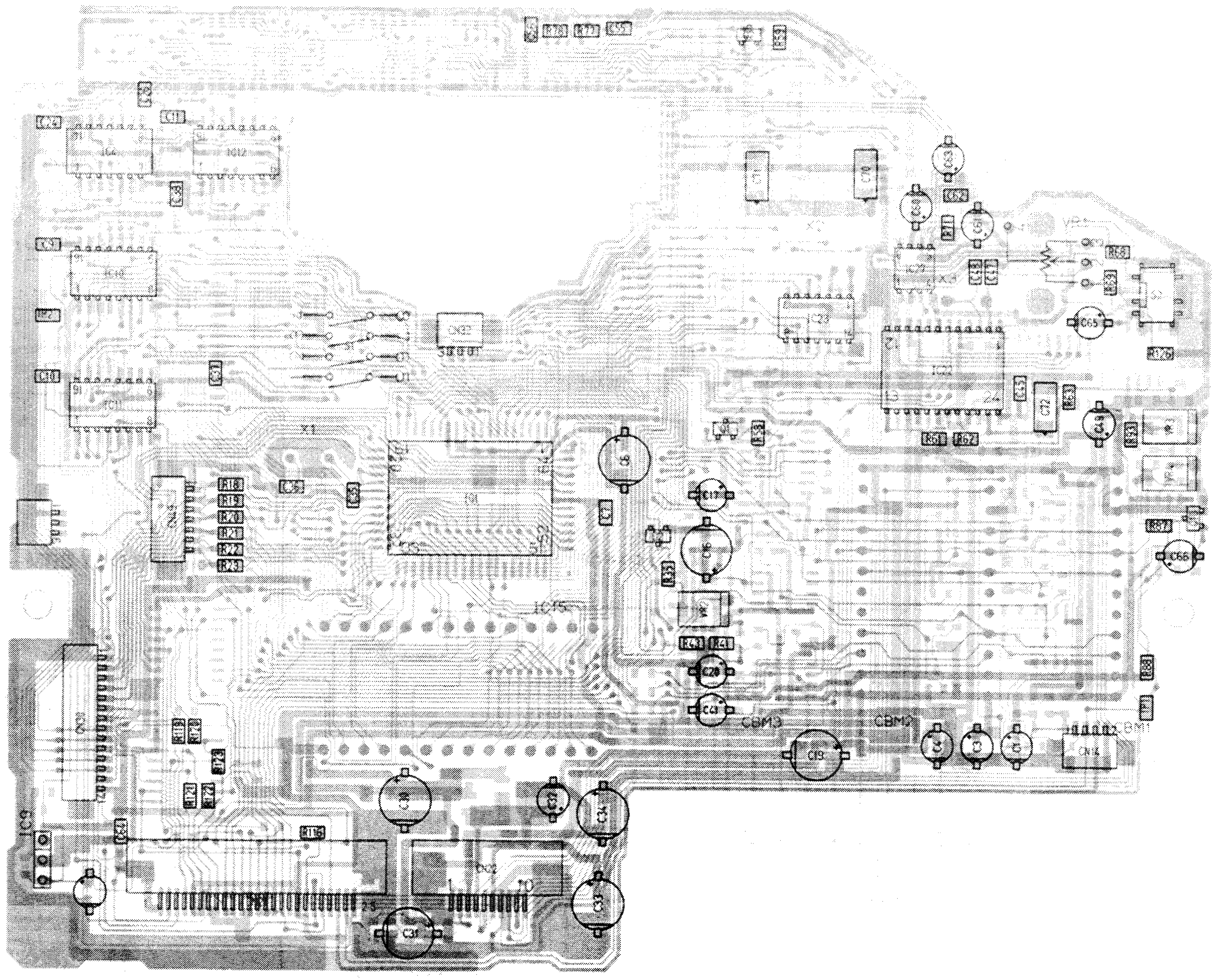

R
302
Q2
VR2
R23
R22
C3
R18
IC1
VR1
R24
R20
R17
R19
Q7
R2
R1
C2
10
7
6
1
Q3
R8
R11
R12
R9
R5
Q1
R16
Q5
R13
Q2
C1
R7
R6
R10
D1
R15
R14
1
6
7
10

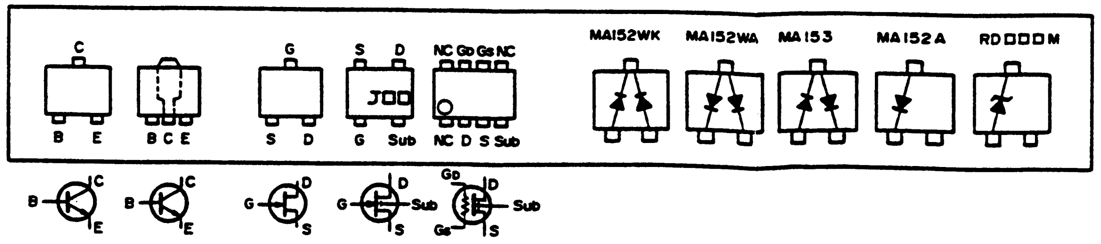
6.16 CP/FC CIRCUIT BOARDS

• FC board

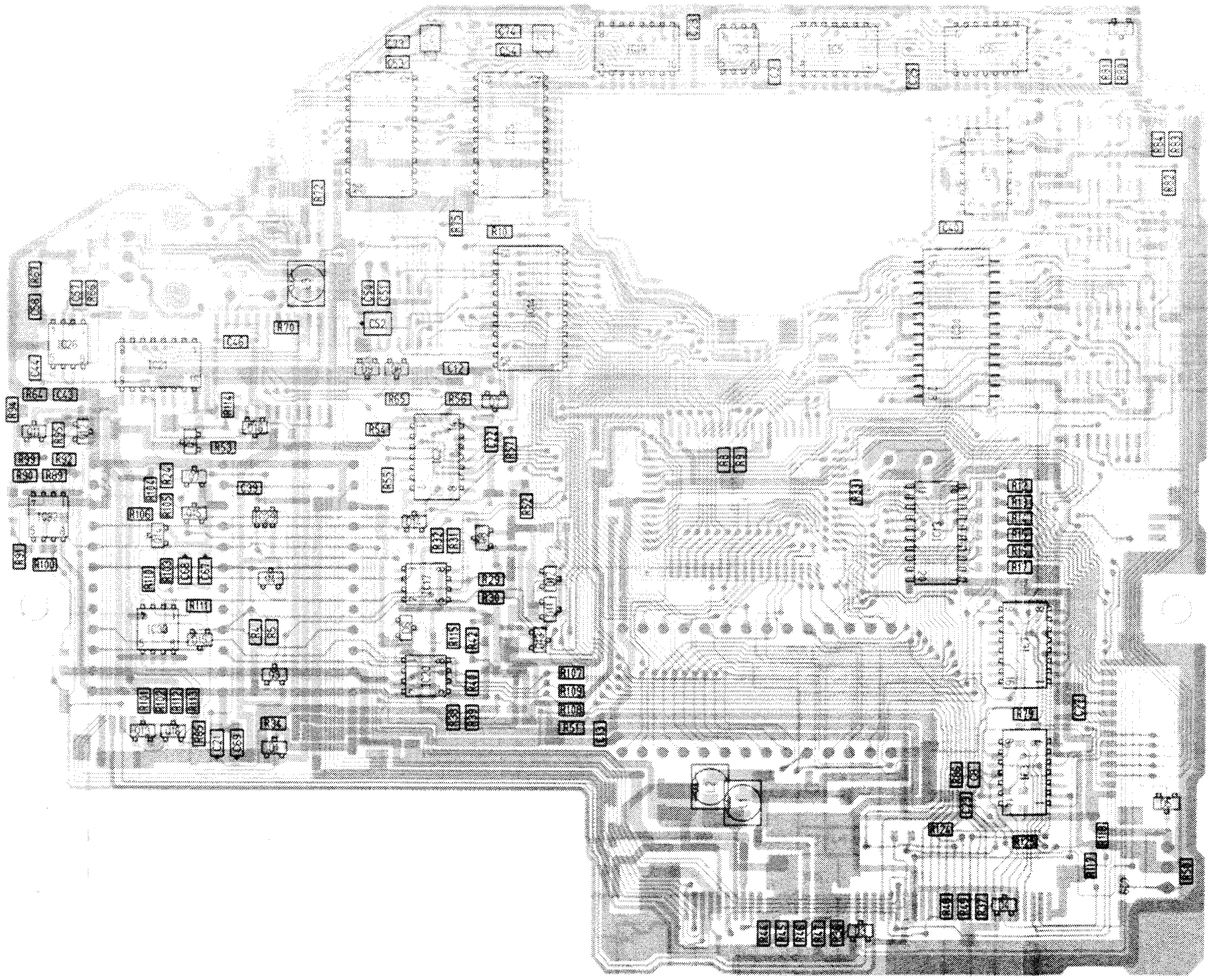

CN41
CN30
S1
S2
S3
S4
S5
S6

Parts side view (A)

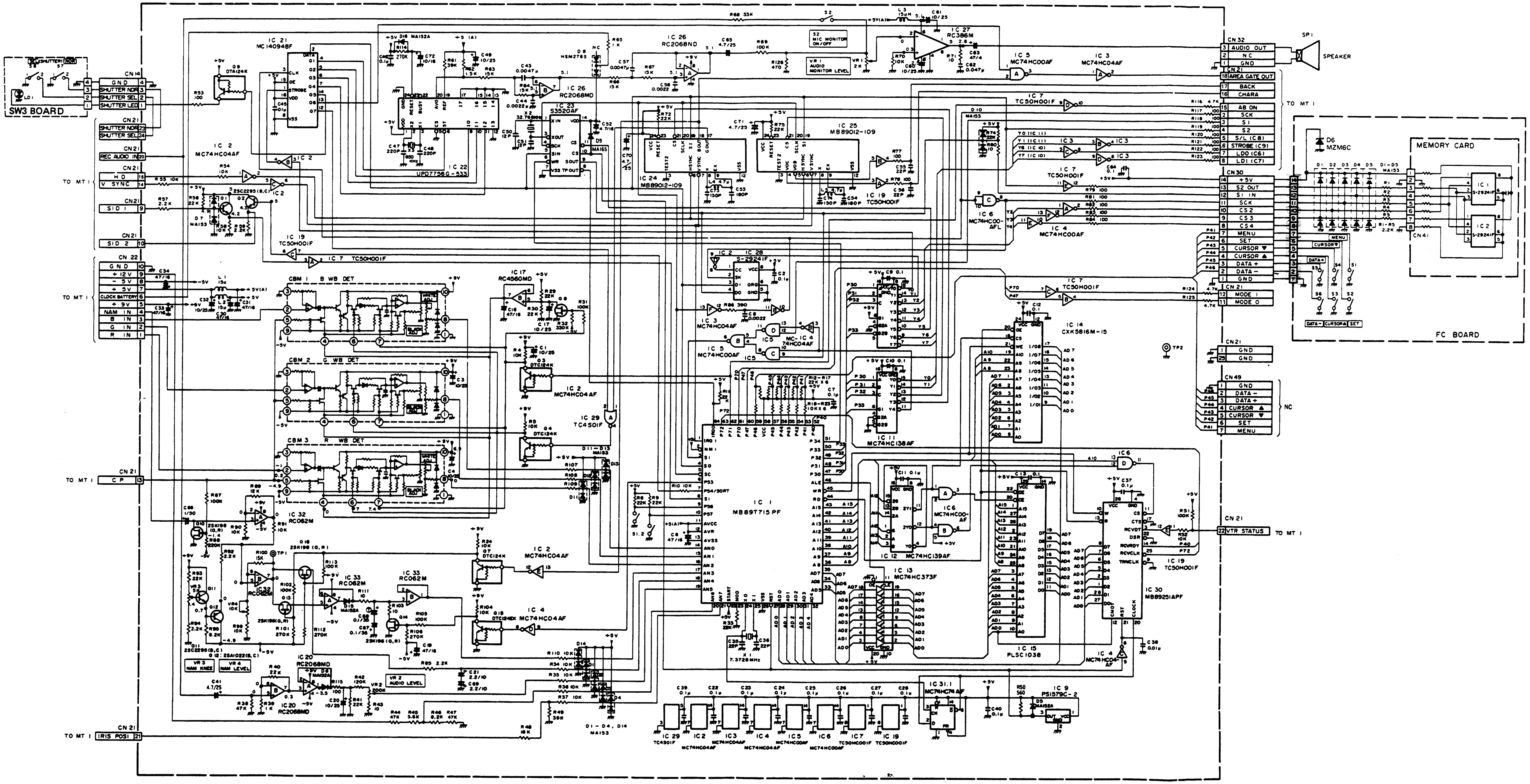

X1
IC5
CBM3
CBM2
BM1
CN14
C19
C31
C33
C34


C
B E
B C E
G
S D
S D
G Sub
NC Gb Gs NC
NC D S Sub
MA152WK
MA152WA
MA153
MA152A
RD□□□M
B
C
E
B
C
E
G
D
S
G
D
Sub
S
Gb
D
Sub
Gs
S

Soldered side view (B)

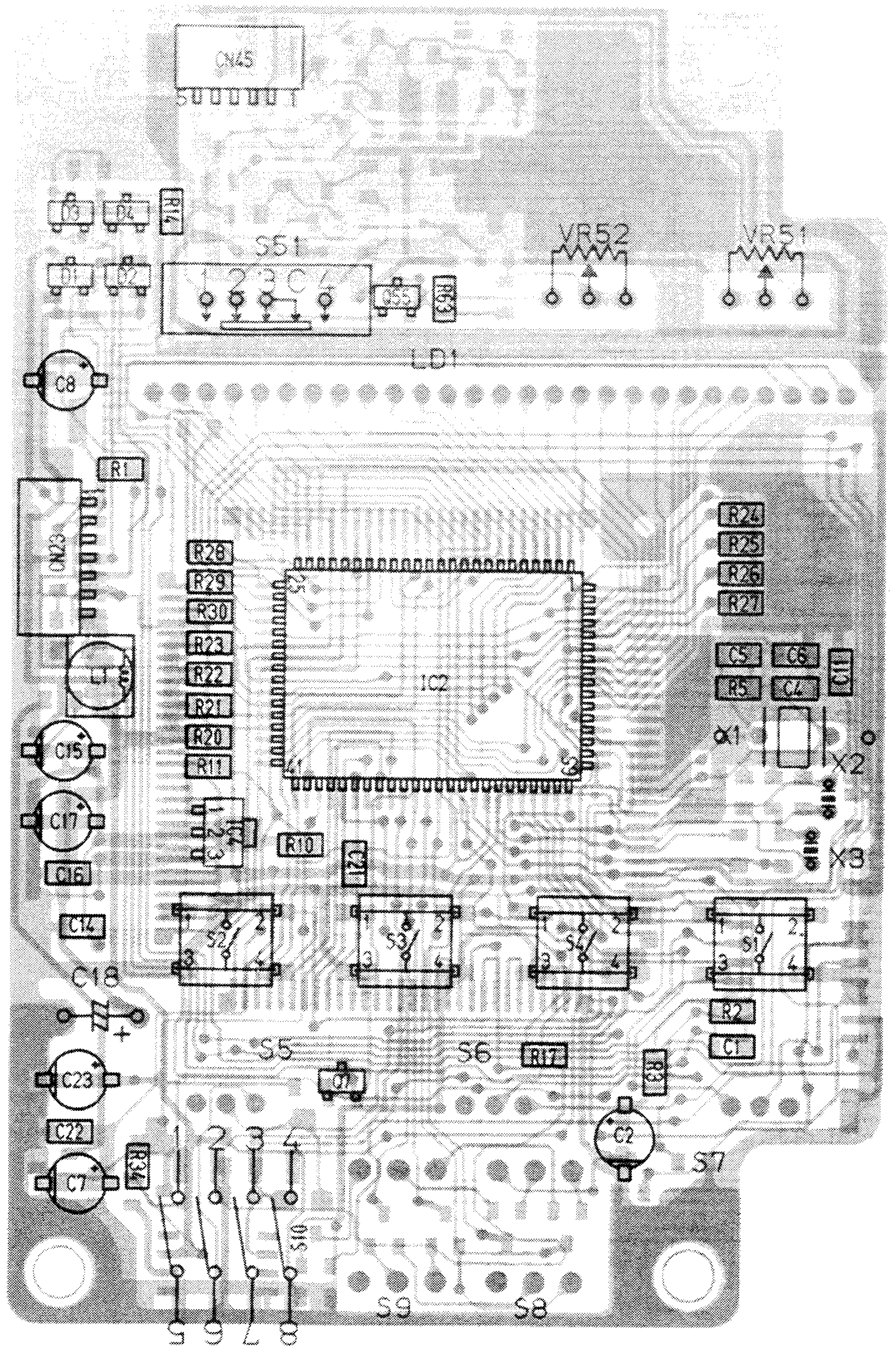


6.17 CP/FC/SW3 BOARDS SCHEMATIC DIAGRAM

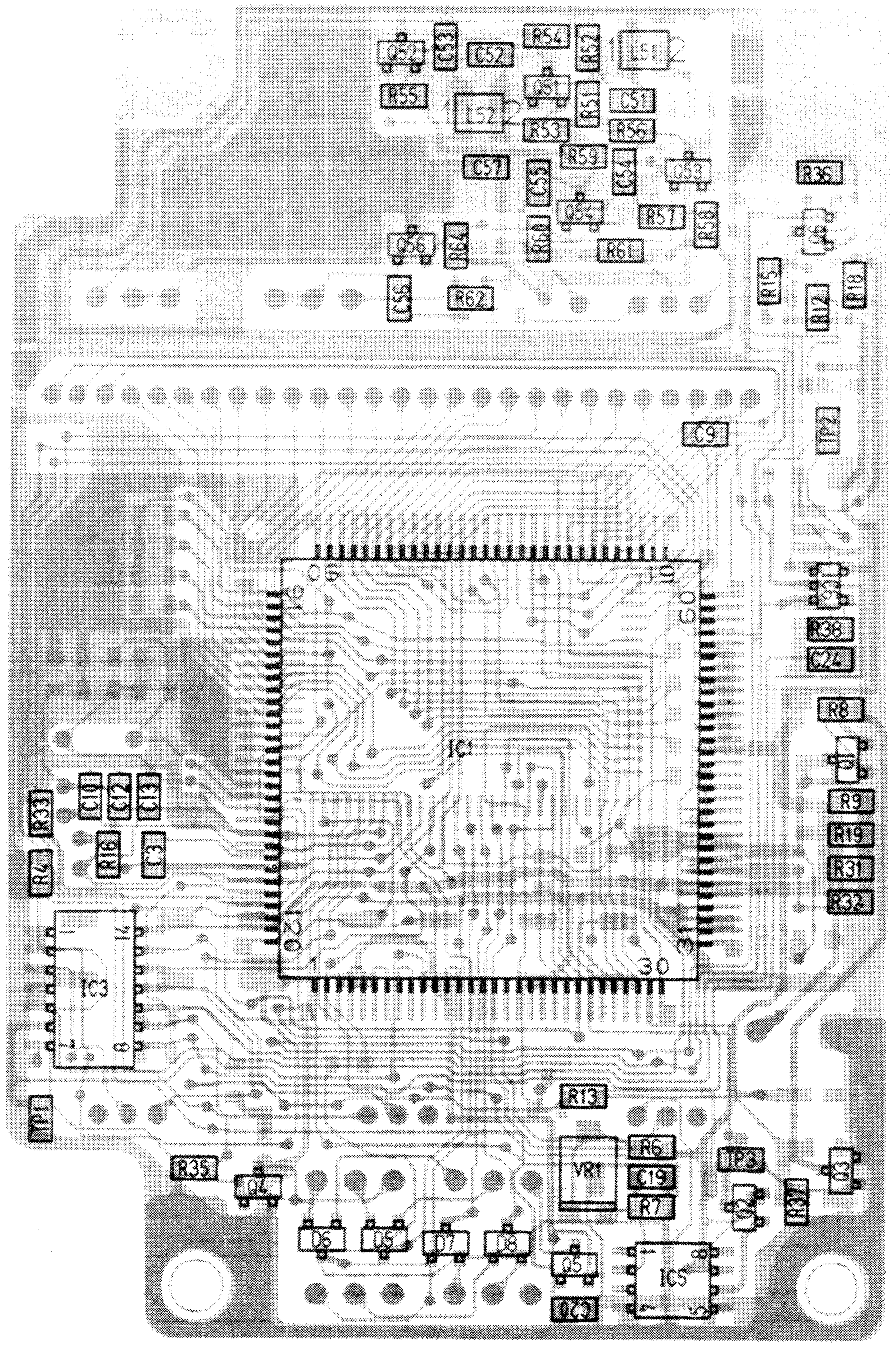

SW3 BOARD
SHUTTER NOR
SHUTTER SEL
SHUTTER LED
LD1
CN14
GND
CN21
REC AUDIO IN
HD
V SYNC
SID 1
SID 2
CN 22
+12V
-5V
+5V
CLOCK BATTERY
+9V
NAM IN
B IN
G IN
R IN
TO MT 1
CP
IRIS POSI
IC 21 MC14094BF
IC 2 MC74HC04AF
IC 22 UPD7756G-533
IC 23 S3520AF
IC 26 RC2068MD
IC 26 RC2068ND
IC 27 RC386M
IC 24 MB89012-109
IC 25 MB89012-109
IC 19 TC50H001F
IC 7 TC50H001F
CBM 1 B WB DET
CBM 2 G WB DET
CBM 3 R WB DET
IC17 RC4560MD
IC 29 TC4501F
IC 28 S-29241F
IC 3 MC74HC04AF
IC 5 MC74HC00AF
IC 1 MB89T715PF
IC 11 MC74HC138AF
IC 14 CXK5816M-15
IC 12 MC74HC139AF
IC 13 MC74HC373F
IC 15 PLSC1038
IC 30 MB89251APF
IC 6 MC74HC00-AF
IC 4 MC74HC04AF
IC 31.1 MC74HC74AF
IC 9 PS1579C-2
IC 32 RC062M
IC 33 RC062M
IC 20 RC2068MD
VR 1 AUDIO MONITOR LEVEL
S2 MIC MONITOR ON/OFF
VR 2 AUDIO LEVEL
VR 3 NAM KNEE
VR 4 NAM LEVEL
X1 7.3728MHz
SP1
SPEAKER
CN32
AUDIO OUT
NC
GND
AREA GATE OUT
BACK
CHARA
AB ON
SCK
S1
S2
S/L (C8)
STROBE (C9)
LDO (C6)
LDI (C7)
CN30
+5V
S2 OUT
S1 IN
CS2
CS3
CS4
MENU
SET
CURSOR ▼
CURSOR ▲
DATA +
DATA -
MODE 1
MODE 0
CN 21
VTR STATUS
CN49
NC
D6 MZM6C
MEMORY CARD
IC 1 S-29241F
IC 2 S-29241F
CN41
D1-D5 MA153
FC BOARD
TP1
TP2

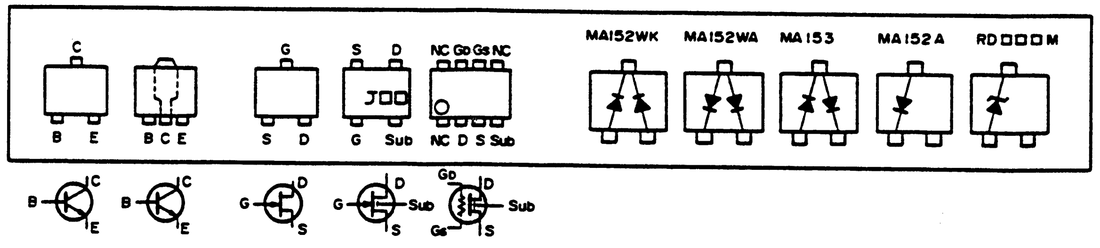
6.18 TC CIRCUIT BOARD

Parts side view (A)

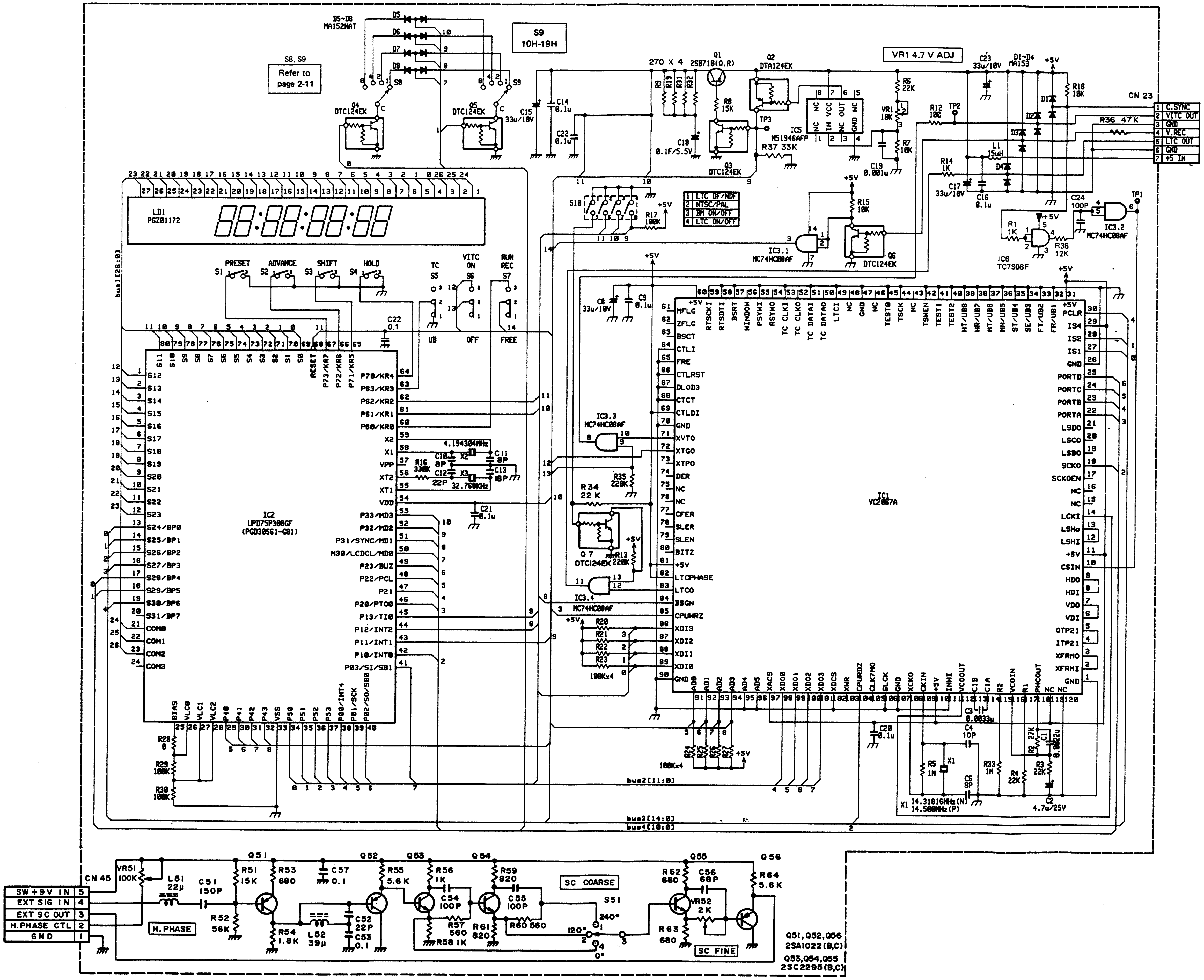

CN45
R14
S51
VR52
VR51
Q55
R63
LD1
C8
R1
CN29
R28
R29
R30
R23
R22
R21
R20
R11
L1
C15
C17
C16
C14
C18
IC4
IC2
R10
C21
R24
R25
R26
R27
C5
C6
R5
C4
C11
X1
X2
X3
S2
S3
S4
S1
R2
C1
S5
S6
R17
Q7
C3
C23
C22
C7
R34
C2
S7
S10
S9
S8
5
6
7
8
1
2
3
4

Soldered side view (B)


Q52
C53
C52
R54
R52
L51
R55
Q51
R51
C51
L52
R53
R56
C57
C55
R59
C54
Q53
R36
Q56
R64
R60
R57
R58
R61
R15
R12
R18
C56
R62
C9
TP2
IC1
Q1
R38
C24
R8
Q9
R9
R19
R31
R32
R33
C10
C12
C13
R4
R16
C3
IC3
TP1
R13
R6
C19
R7
VR1
TP3
R35
Q4
Q3
Q2
R37
D6
D5
D7
D8
Q5
IC5
C20


C
B E
B C E
G
S D
S D
G Sub
NC Gp Gs NC
NC D S Sub
MA152WK
MA152WA
MA153
MA152A
RD□□□M
B
C
E
G
D
S
Sub
Gp
Gs

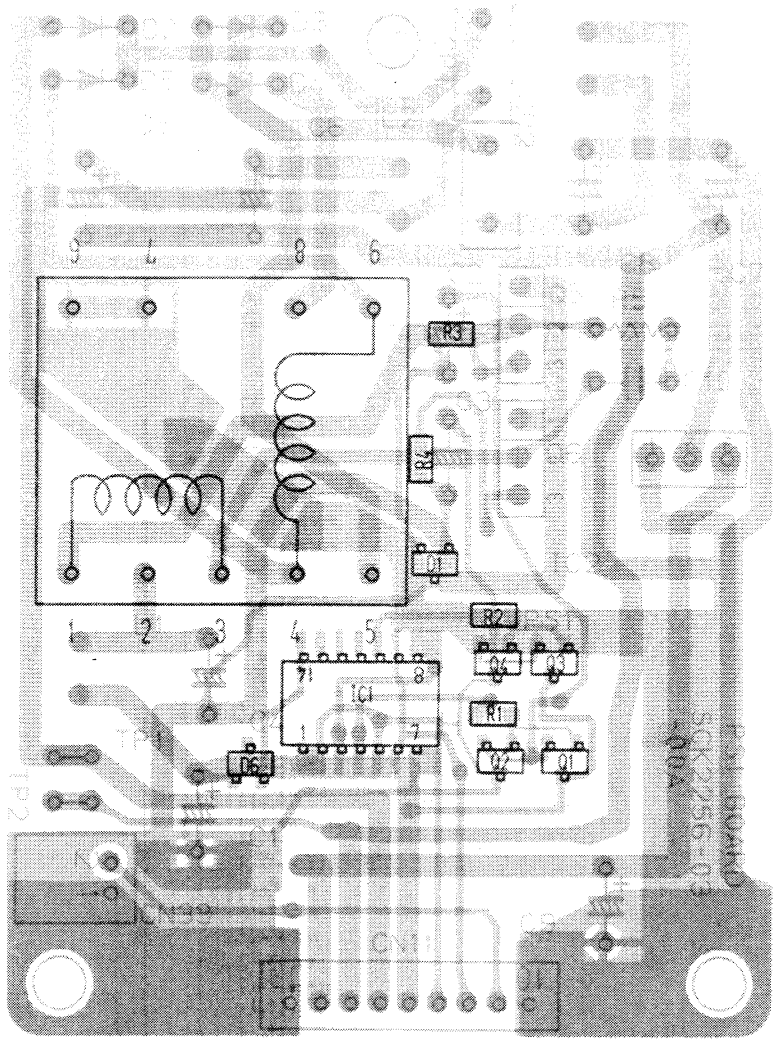
4.19 TC BOARD SCHEMATIC DIAGRAM


D5~D8
MA152WAT
D5
D6
D7
D8
S9
10H-19H
S8, S9
Refer to page 2-11
S8
S9
Q4
DTC124EK
Q5
DTC124EK
C15
33u/10V
C14
0.1u
C22
0.1u
270 X 4
R9
R19
R31
R32
Q1
2SB710(Q,R)
R8
15K
C18
0.1F/5.5V
Q2
DTA124EK
Q3
DTC124EK
TP3
IC5
M51946AFP
R37 33K
NC
IN
NC
VCC
GND
OUT
NC
VR1 4.7 V ADJ
R6
22K
VR1
10K
R7
10K
C19
0.001u
R12
100
TP2
C23
33u/10V
D1~D4
MA153
+5V
R18
10K
L1
15uH
R14
1K
C17
33u/10V
C16
0.1u
CN 23
C.SYNC
VITC OUT
GND
V.REC
LTC OUT
GND
+5 IN
R36 47K
LD1
PGZ01172
S10
R17
100K
LTC DF/NDF
NTSC/PAL
BM ON/OFF
LTC ON/OFF
R15
10K
IC3.1
MC74HC08AF
Q6
DTC124EK
R1
1K
IC6
TC7S08F
R38
12K
C24
100P
IC3.2
MC74HC08AF
TP1
PRESET
ADVANCE
SHIFT
HOLD
S1
S2
S3
S4
TC
S5
VITC ON
S6
RUN REC
S7
UB
OFF
FREE
C22
0.1
C8
33u/10V
C9
0.1u
bus1[26:0]
IC2
UPD75P308GF
(PGD30561-G01)
4.194304MHz
C10
8P
X2
C11
8P
R16
330K
C12
22P
X3
32.768KHz
C13
18P
C21
0.1u
IC3.3
MC74HC08AF
R35
220K
R34
22 K
Q7
DTC124EK
R13
220K
IC3.4
MC74HC08AF
R20
R21
R22
R23
100Kx4
IC1
VC2067A
R28
0
R29
100K
R30
100K
R24
R25
R26
R27
100Kx4
C20
0.1u
bus2[11:0]
bus3[14:0]
bus4[10:0]
C3
0.0033u
C4
10P
R5
1M
X1
C6
8P
R33
1M
X1 14.31818MHz(N)
14.500MHz(P)
R2
27K
C1
0.0022u
R4
22K
R3
22K
C2
4.7u/25V
CN 45
SW +9V IN
EXT SIG IN
EXT SC OUT
H.PHASE CTL
GND
VR51
100K
L51
22µ
C51
150P
R51
15K
R52
56K
Q51
R53
680
R54
1.8K
C57
0.1
L52
39µ
C52
22P
C53
0.1
Q52
R55
5.6K
Q53
R56
1K
C54
100P
R57
560
R58 1K
Q54
R59
820
C55
100P
R61
820
R60 560
SC COARSE
S51
240°
120°
0°
Q55
R62
680
C56
68P
VR52
2 K
R63
680
SC FINE
Q56
R64
5.6K
H.PHASE
Q51, Q52, Q56
2SA1022(B,C)
Q53, Q54, Q55
2SC2295(B,C)

6.20 PS1/PS2 CIRCUIT BOARDS

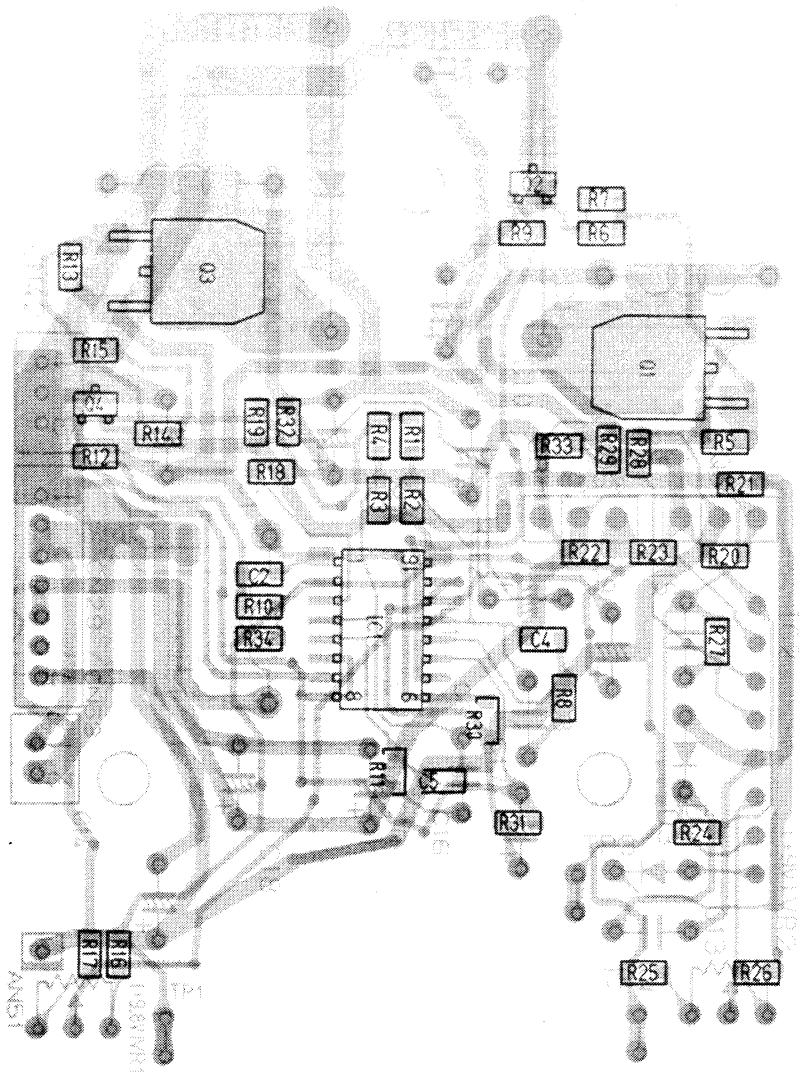
●PS1 board

Soldered side view (B)

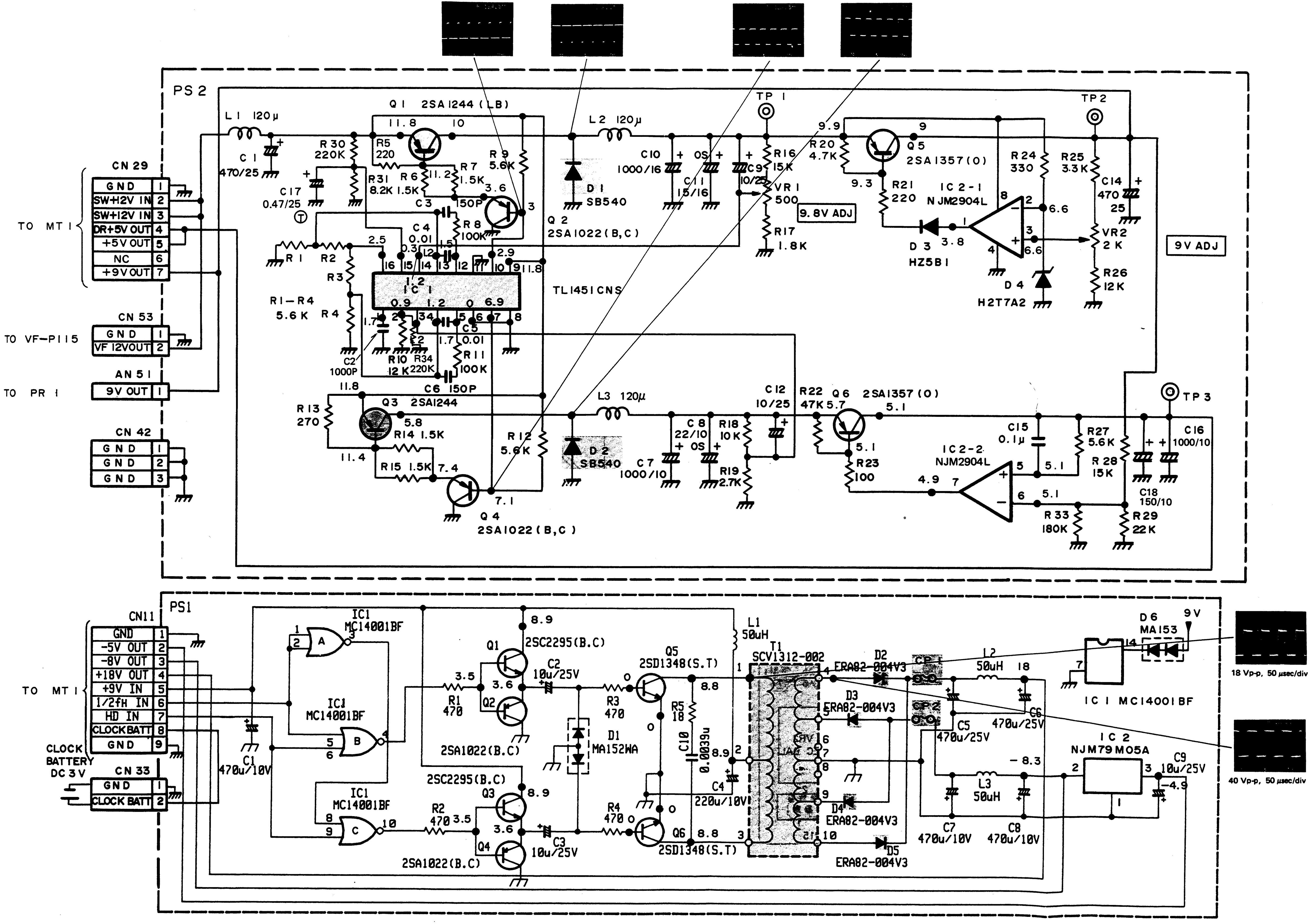

9
L
8
6
R3
R4
D1
1
2
3
4
5
R2
Q4
Q3
7
IC1
8
1
7
R1
TP1
D6
Q2
Q1
TP2
CN39
CN11
PS1 BOARD
SCK2256-03
-00A

●PS2 board

Soldered side view (B)


Q2
R7
R9
R6
R13
Q3
R15
Q1
Q4
R19
R32
R4
R1
R14
R12
R18
R33
R29
R28
R5
R3
R2
R21
R22
R23
R20
C2
R10
R34
IC1
C4
R27
R8
R30
R11
C5
R31
R24
R17
R16
TP1
R25
R26

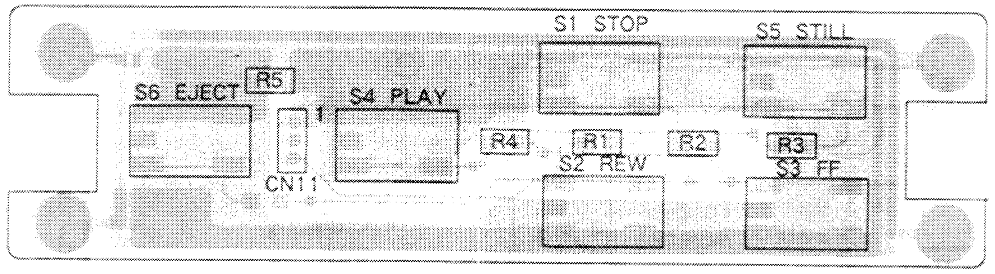
6.21 PS1/PS2 BOARDS SCHEMATIC DIAGRAM


11 Vp-p, 10 μsec/div
13 Vp-p, 10 μsec/div
11 Vp-p, 10 μsec/div
13 Vp-p, 10 μsec/div
PS 2
TO MT I
CN 29
GND 1
SW+12V IN 2
SW+12V IN 3
DR+5V OUT 4
+5V OUT 5
NC 6
+9V OUT 7
TO VF-P115
CN 53
GND 1
VF 12V OUT 2
TO PR I
AN 51
9V OUT 1
CN 42
GND 1
GND 2
GND 3
L1 120μ
C1 470/25
C17 0.47/25
R30 220K
R5 220
R31 8.2K
R6 1.5K
R7 1.5K
Q1 2SA1244 (LB)
11.8
10
11.2
3.6
R9 5.6K
C3 150P
C4 0.01
R8 100K
Q2 2SA1022 (B,C)
R1 R2
R1-R4 5.6 K
R3
R4
2.5
0.3
2.9
1.2
IC 1
TL1451CNS
0.9 1.2 0 6.9
1.7
C2 1000P
R10 12 K
R34 220K
C5 0.01
R11 100K
C6 150P
L2 120μ
D1 SB540
C10 1000/16
C11 15/16
C9 10/25
OS
TP 1
R16 15K
VR 1 500
9.8V ADJ
R17 1.8K
9.9
R20 4.7K
9.3
Q5 2SA1357 (O)
9
R21 220
D3 HZ5B1
3.8
IC 2-1 NJM2904L
6.6
D4 H2T7A2
R24 330
R25 3.3K
TP 2
C14 470 25
VR2 2 K
R26 12K
9V ADJ
11.8
R13 270
Q3 2SA1244
5.8
R14 1.5K
11.4
R15 1.5K
7.4
Q4 2SA1022 (B,C)
7.1
R12 5.6K
L3 120μ
D2 SB540
C7 1000/10
C8 22/10
R18 10K
R19 2.7K
C12 10/25
R22 47K
Q6 2SA1357 (O)
5.7
5.1
R23 100
4.9
IC 2-2 NJM2904L
C15 0.1μ
R27 5.6K
R28 15K
R33 180K
R29 22K
C16 1000/10
C18 150/10
TP 3
PS1
TO MT I
CN11
GND 1
-5V OUT 2
-8V OUT 3
+18V OUT 4
+9V IN 5
1/2fH IN 6
HD IN 7
CLOCK BATT 8
GND 9
CLOCK BATTERY DC 3V
CN 33
GND 1
CLOCK BATT 2
C1 470u/10V
IC1 MC14001BF
A
B
C
8.9
Q1 2SC2295 (B.C)
3.5
R1 470
3.6
Q2 2SA1022 (B.C)
C2 10u/25V
D1 MA152WA
Q3 2SC2295 (B.C)
R2 470
Q4 2SA1022 (B.C)
C3 10u/25V
Q5 2SD1348 (S.T)
R3 470
R5 18
C10 0.0039u
8.8
8.9
C4 220u/10V
R4 470
Q6 2SD1348 (S.T)
L1 50uH
T1 SCV1312-002
D2 ERA82-004V3
D3 ERA82-004V3
D4 ERA82-004V3
D5 ERA82-004V3
CP 1
CP 2
L2 50uH
18
C5 470u/25V
C6 470u/25V
-8.3
L3 50uH
C7 470u/10V
C8 470u/10V
IC 2 NJM79M05A
C9 10u/25V
-4.9
D6 MA153
9V
IC 1 MC14001BF
18 Vp-p, 50 μsec/div
40 Vp-p, 50 μsec/div

6.22 LD/OP CIRCUIT BOARD

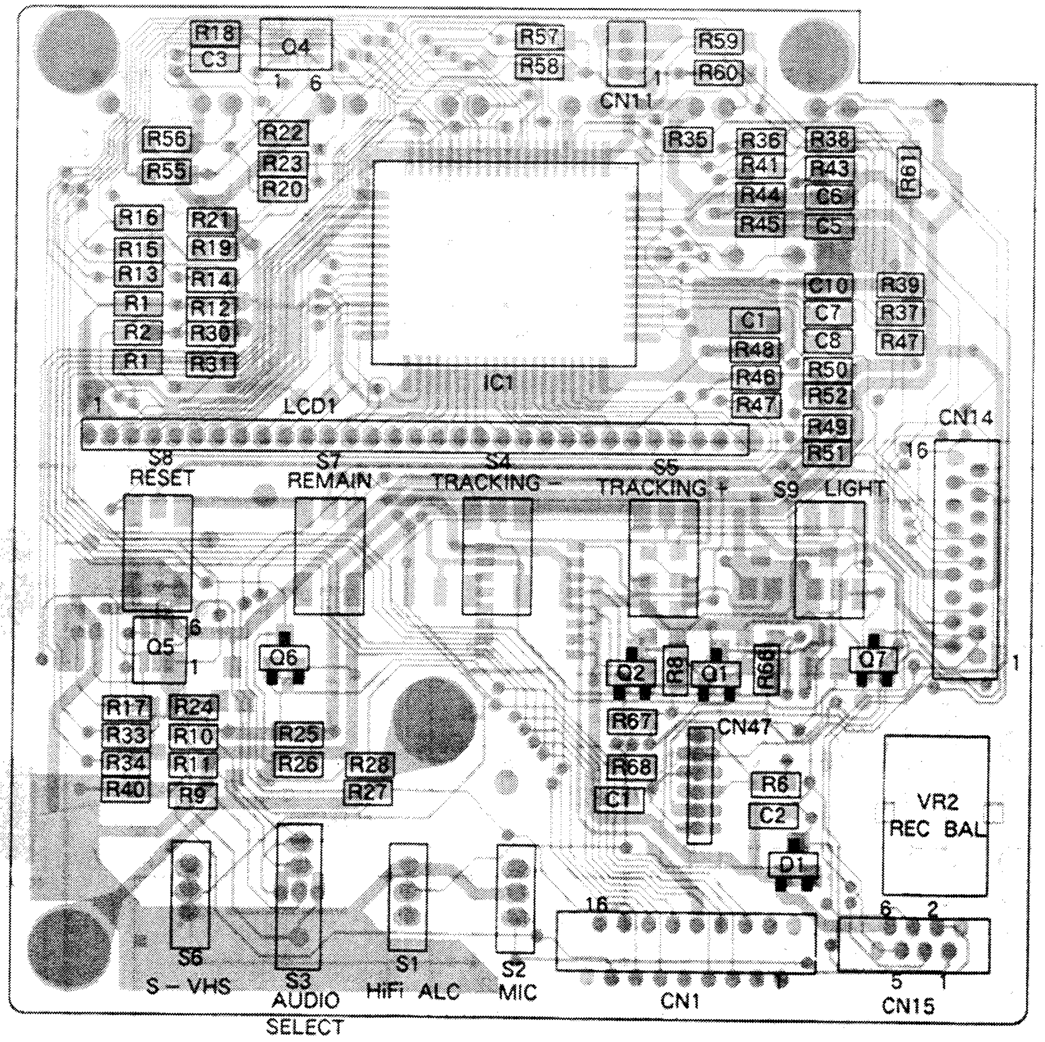
Note: This circuit board diagram is only for reference.
Avoid replacing individual parts.
Replacing the entire unit only.

● OP board

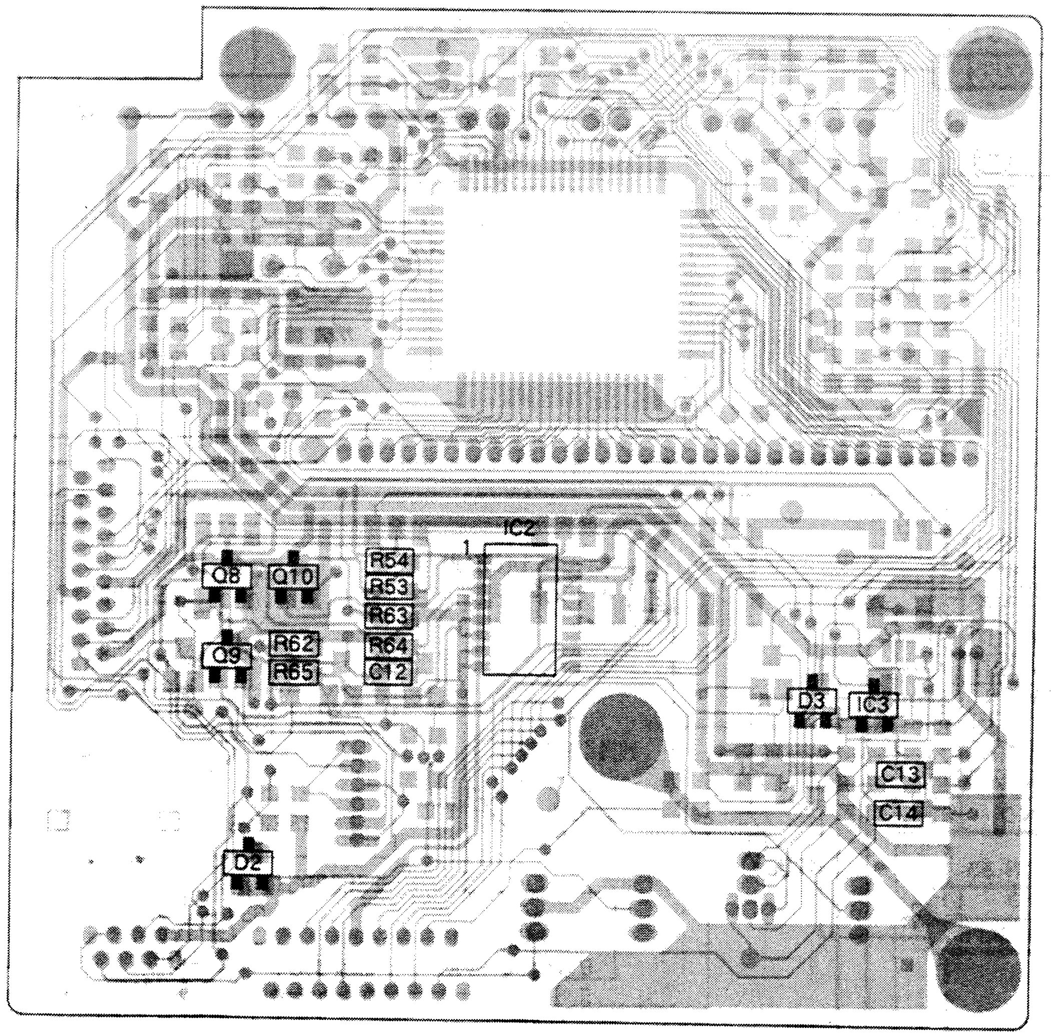

S1 STOP
S5 STILL
S6 EJECT
R5
S4 PLAY
1
CN11
R4
R1
R2
R3
S2 REW
S3 FF

● LD board

Parts side view (A)

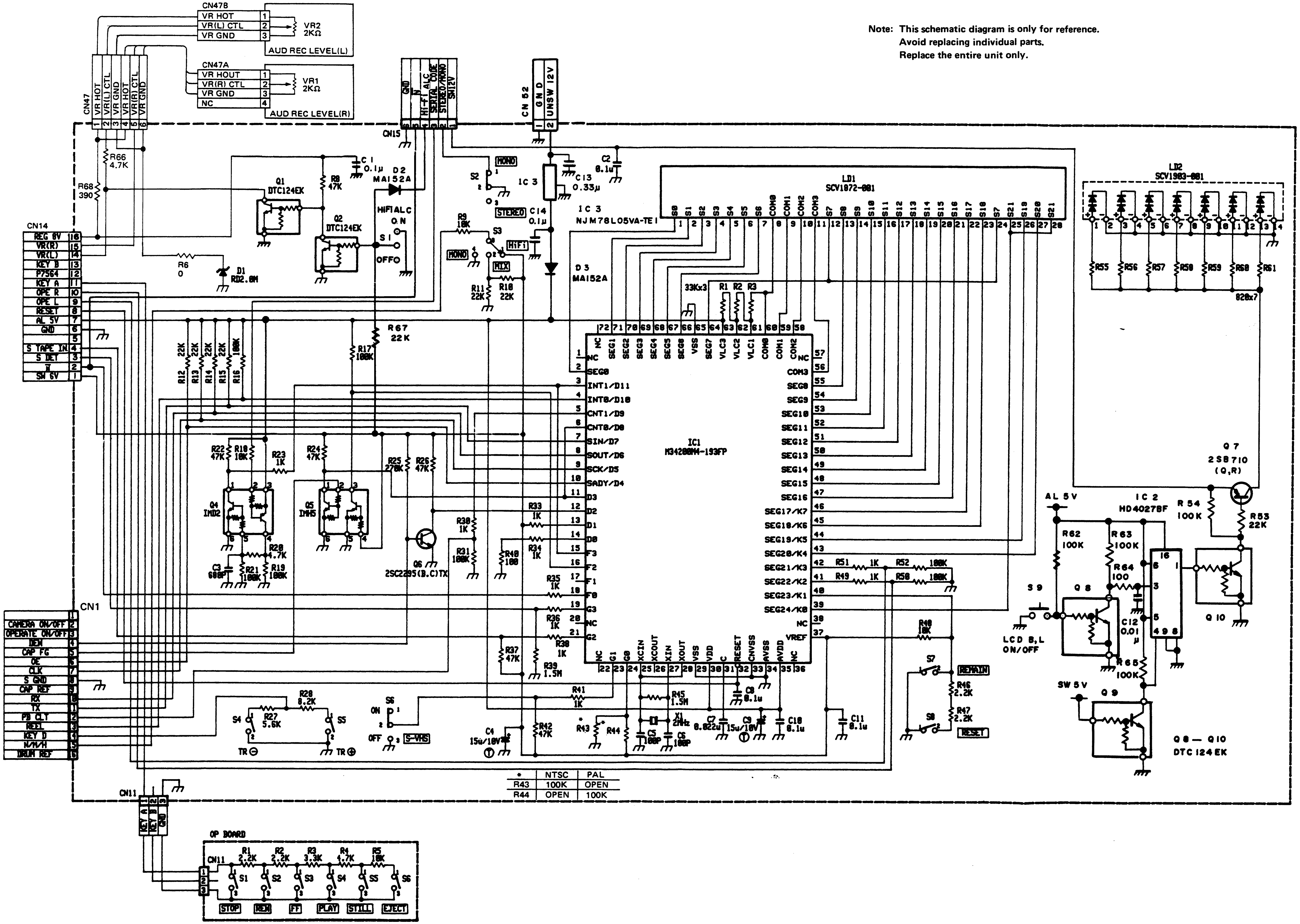

R18
C3
Q4
1 6
R57
R58
CN11
1
R59
R60
R56
R55
R22
R23
R20
R35
R36
R41
R44
R45
R38
R43
C6
C5
R61
R16
R15
R13
R1
R2
R1
R21
R19
R14
R12
R30
R31
C10
C7
C8
R39
R37
R47
C1
R48
R46
R47
R50
R52
R49
R51
IC1
LCD1
1
CN14
16
S8 RESET
S7 REMAIN
S4 TRACKING –
S5 TRACKING +
S9 LIGHT
Q5
6
1
Q6
Q2
R8
Q1
R66
Q7
1
R17
R33
R34
R40
R24
R10
R11
R9
R25
R26
R28
R27
R67
CN47
R68
C1
R6
C2
D1
VR2 REC BAL
S6 S – VHS
S3 AUDIO SELECT
S1 HiFi ALC
S2 MIC
16
CN1
6 2
5 1
CN15

Soldered side view (B)


IC2
1
Q8
Q10
Q9
R54
R53
R63
R62
R65
R64
C12
D3
IC3
C13
C14
D2

6.23 LD/OP BOARD SCHEMATIC DIAGRAM

Note: This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

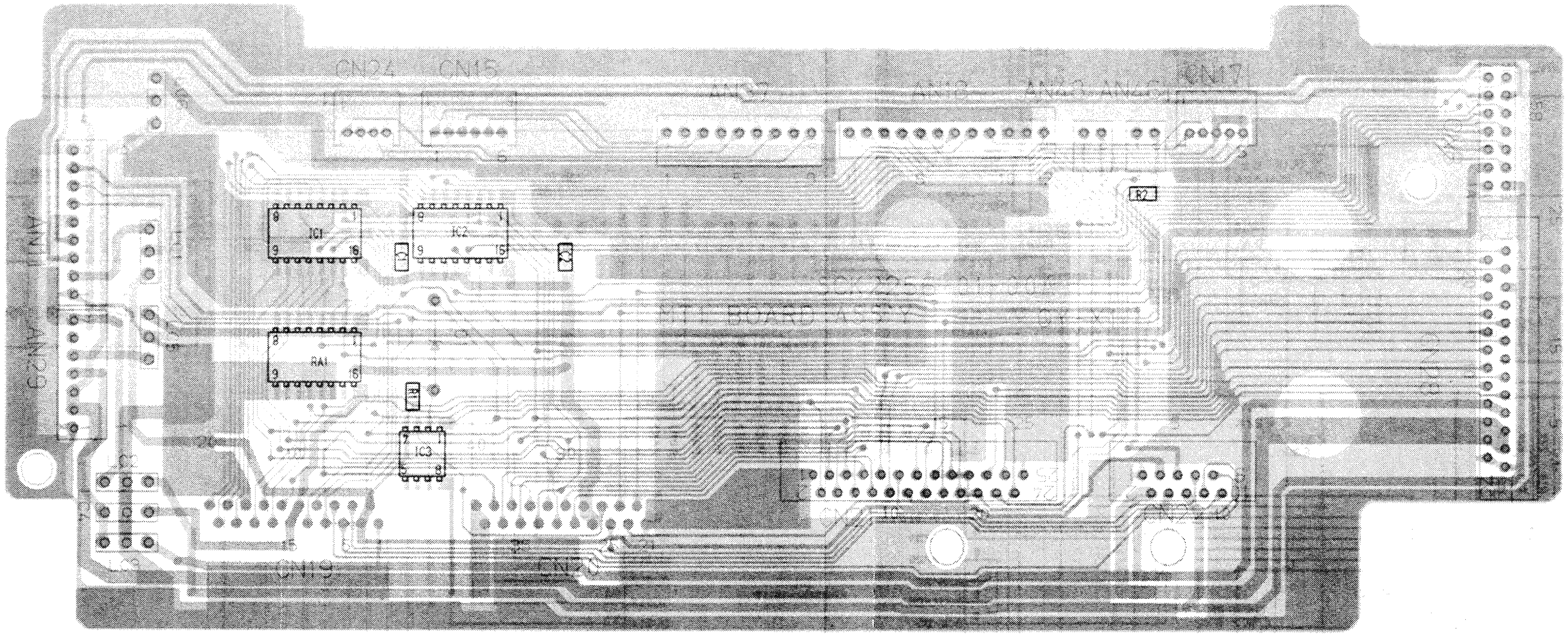

CN47B
VR HOT
VR(L) CTL
VR GND
VR2
2KΩ
AUD REC LEVEL(L)
CN47A
VR HOUT
VR(R) CTL
VR GND
NC
VR1
2KΩ
AUD REC LEVEL(R)
CN47
VR HOT
VR(L) CTL
VR GND
VR HOT
VR(R) CTL
VR GND
GND
N
HI-FI ALC
SERIAL CODE
STEREO/MONO
SW12V
CN15
CN 52
GND
UNSW 12V
R66
4.7K
R68
390
CN14
REG 8V
VR(R)
VR(L)
KEY B
P7564
KEY A
OPE R
OPE L
RESET
AL 5V
GND
S TAPE IN
S DET
SW 6V
Q1
DTC124EK
R8
47K
C1
0.1μ
D2
MA152A
Q2
DTC124EK
HiFi ALC
ON
S1
OFF
R6
0
D1
RD2.0M
S2
MONO
STEREO
IC3
C13
0.33μ
C2
0.1μ
C14
0.1μ
IC3
NJM78L05VA-TE1
R9
18K
S3
MONO
MIX
HiFi
R11
22K
R10
22K
D3
MA152A
LD1
SCV1072-001
LD2
SCV1903-001
R55
R56
R57
R58
R59
R60
R61
820x7
33Kx3
R1
R2
R3
R67
22K
R17
100K
R12
R13
R14
R15
R16
22K
22K
22K
22K
100K
IC1
M34280M4-193FP
R22
47K
R18
10K
R23
1K
R24
47K
R25
270K
R26
47K
Q4
IMD2
Q5
IMH5
R20
4.7K
C3
680P
R21
100K
R19
100K
Q6
2SC2295(B,C)TX
R33
1K
R30
1K
R31
100K
R34
1K
R40
100
R35
1K
R36
1K
R38
1K
R37
47K
R39
1.5M
R41
1K
R42
47K
R43
R44
R45
1.5M
X1
2MHz
C5
100P
C6
100P
C7
0.022μ
C8
15u/10V
C9
0.1u
C10
0.1u
C11
0.1u
C4
15u/10V
R51
1K
R52
100K
R49
1K
R50
100K
R48
10K
S7
REMAIN
R46
2.2K
S8
R47
2.2K
RESET
Q7
2SB710
(Q,R)
AL 5V
IC2
HD40278F
R54
100K
R53
22K
R62
100K
R63
100K
R64
100
Q8
C12
0.01μ
R65
100K
S9
LCD B,L
ON/OFF
Q10
SW 5V
Q9
Q8 — Q10
DTC124EK
CN1
CAMERA ON/OFF
OPERATE ON/OFF
DEN
CAP FG
OE
CLK
S GND
CAP REF
RX
TX
PB CLT
REEL
KEY D
N/M/H
DRUM REF
R28
8.2K
S4
R27
5.6K
S5
TR⊖
TR⊕
S6
ON
OFF
S-VHS
CN11
KEY A
KEY B
GND
OP BOARD
CN11
R1
2.2K
R2
2.2K
R3
3.3K
R4
4.7K
R5
10K
S1
S2
S3
S4
S5
S6
STOP
REW
FF
PLAY
STILL
EJECT

*	NTSC	PAL
R43	100K	OPEN
R44	OPEN	100K

6.24 MT1/MT2/SWITCHES CONNECTORS CIRCUIT BOARD

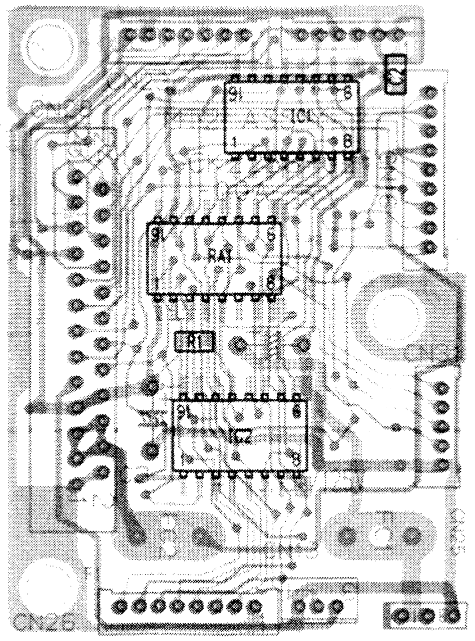
• MT1 board

Soldered side view (B)


CN24
CN15
CN17
IC1
IC2
RA1
R1
R2
IC3
AN11
AN29
CN19
MT1 BOARD ASSY

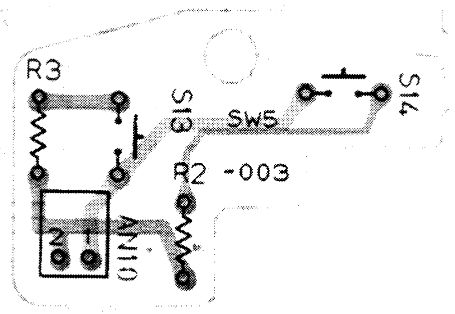
• MT2 board

Soldered side view (B)

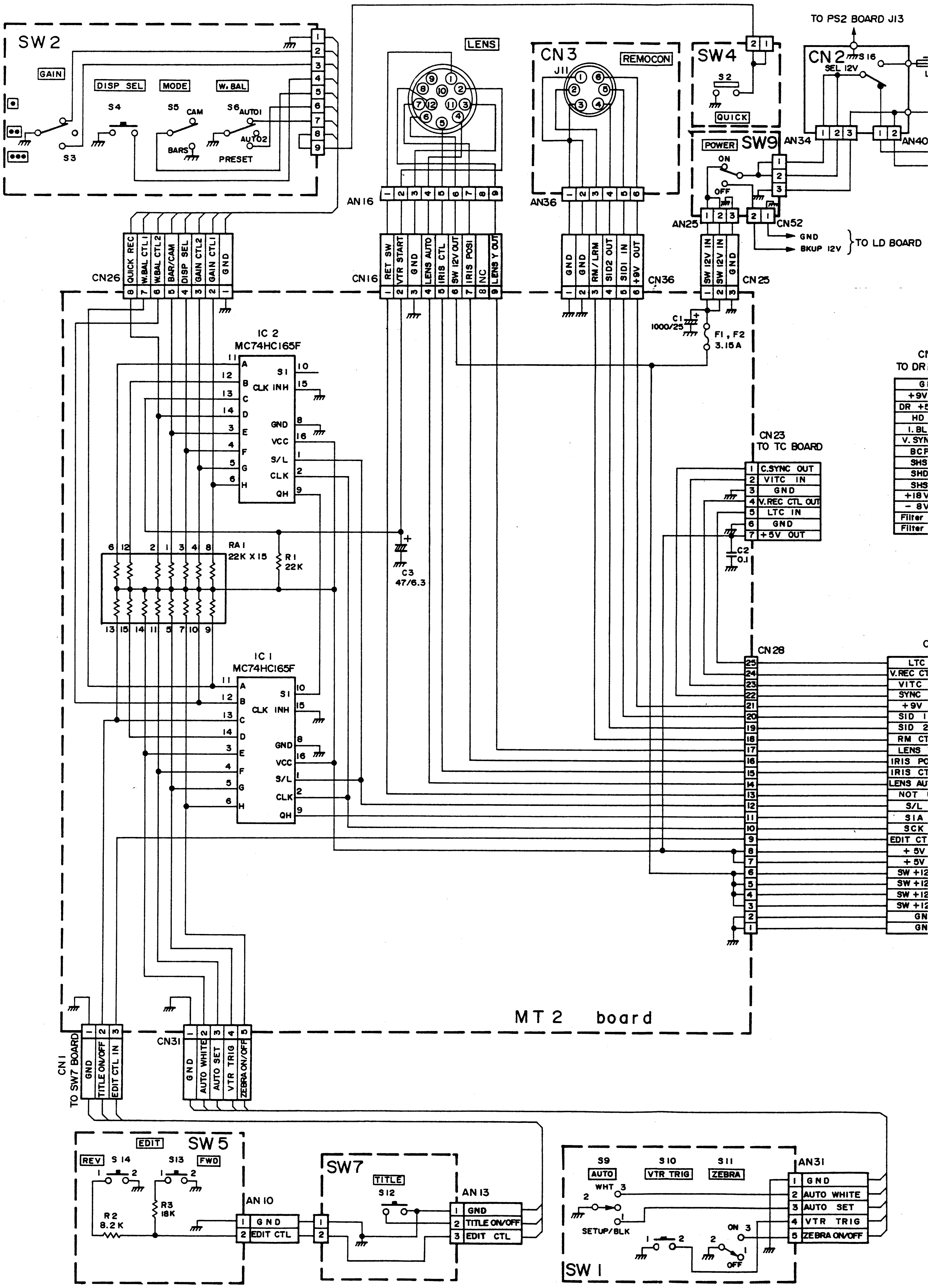

IC1
RA1
R1
IC2
CN26

• SW5 board

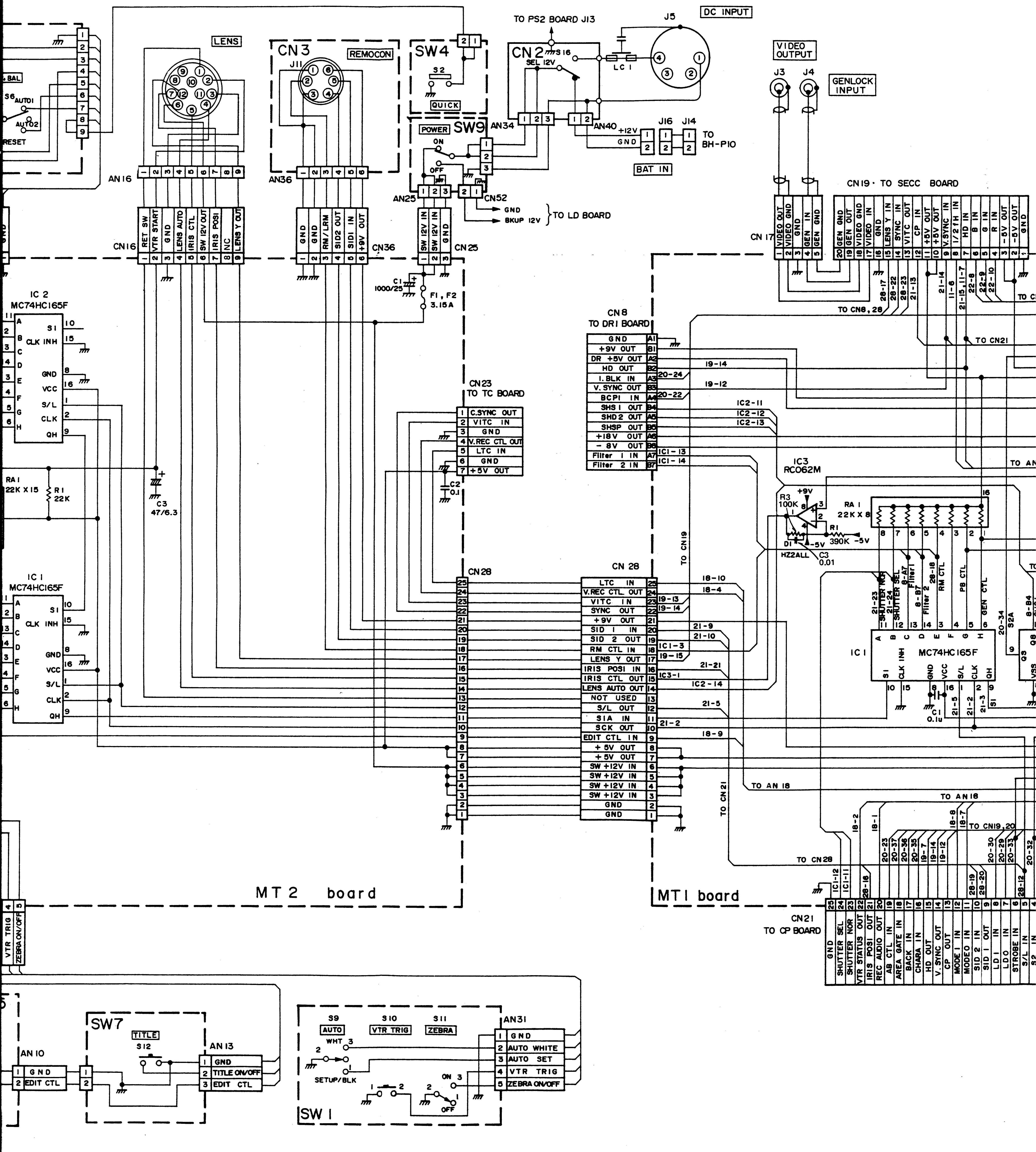
Soldered side view (B)

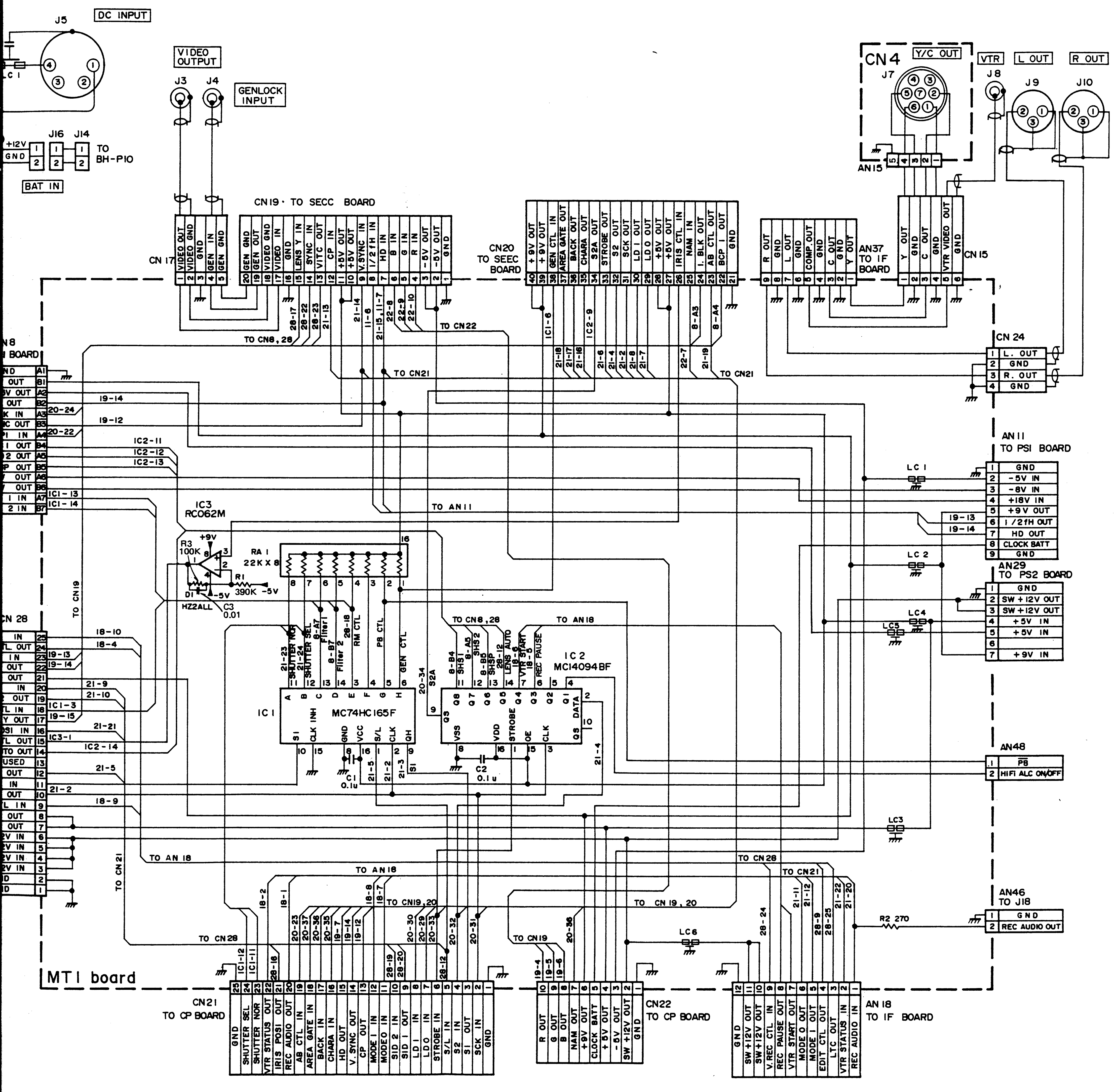

R3
S13
SW5
S14
R2 -003
AN10
2
1

6.25 MT1/MT2/SWITCHES•CONNECTORS BOARD SCHEMATIC DIAGRAM

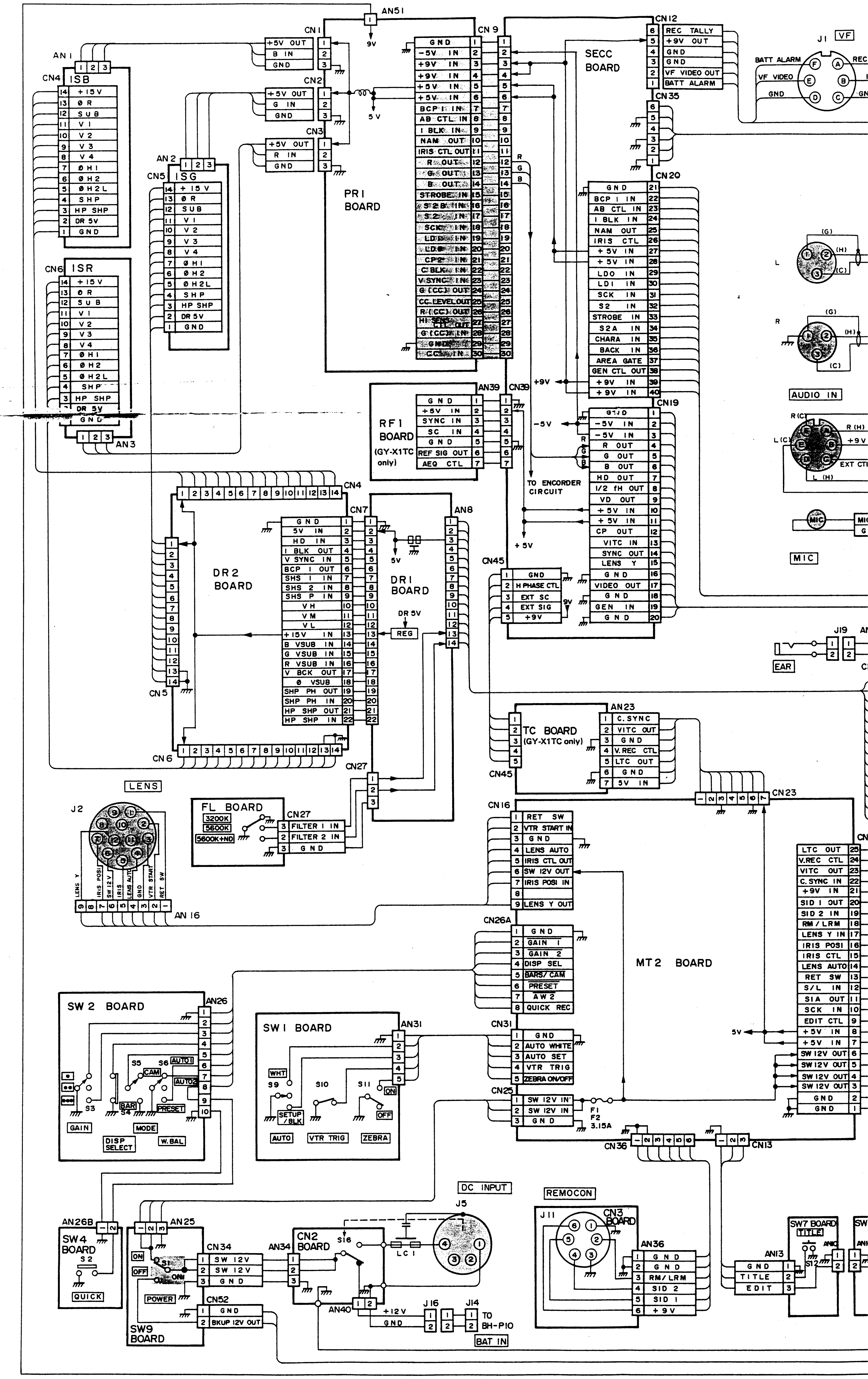

SW2
GAIN
DISP SEL
MODE
W. BAL
S3
S4
S5
CAM
BARS
S6
AUTO1
AUTO2
PRESET
LENS
CN3
J11
REMOCON
SW4
S2
QUICK
TO PS2 BOARD J13
CN2
S16
SEL 12V
AN34
AN40
POWER
SW9
ON
OFF
AN25
CN52
GND
BKUP 12V
TO LD BOARD
AN16
AN36
CN26
QUICK REC
W.BAL CTL1
W.BAL CTL2
BAR/CAM
DISP SEL
GAIN CTL2
GAIN CTL1
GND
CN16
RET SW
VTR START
GND
LENS AUTO
IRIS CTL
SW 12V OUT
IRIS POSI
NC
LENS Y OUT
CN36
GND
GND
RM/LRM
SID2 OUT
SID1 IN
+9V OUT
CN25
SW 12V IN
SW 12V IN
GND
C1
1000/25
F1, F2
3.15A
IC 2
MC74HC165F
IC 1
MC74HC165F
SI
CLK INH
GND
VCC
S/L
CLK
QH
RA1
22K X 15
R1
22K
C3
47/6.3
CN23
TO TC BOARD
C.SYNC OUT
VITC IN
GND
V.REC CTL OUT
LTC IN
GND
+5V OUT
C2
0.1
CN28
LTC
V.REC CT
VITC
SYNC
+9V
SID 1
SID 2
RM CT
LENS
IRIS PO
IRIS CT
LENS AU
NOT
S/L
SIA
SCK
EDIT CT
+5V
+5V
SW +12
SW +12
SW +12
SW +12
GN
GN
TO DR
+9V
DR +5
HD
I. BL
V. SYN
BCF
SHS
SHD
SHS
+18V
- 8V
Filter
Filter
MT 2 board
CN1
TO SW7 BOARD
GND
TITLE ON/OFF
EDIT CTL IN
CN31
GND
AUTO WHITE
AUTO SET
VTR TRIG
ZEBRA ON/OFF
EDIT
SW5
REV
S14
S13
FWD
R2
8.2K
R3
18K
AN10
GND
EDIT CTL
SW7
TITLE
S12
AN13
GND
TITLE ON/OFF
EDIT CTL
S9
AUTO
WHT
SETUP/BLK
S10
VTR TRIG
S11
ZEBRA
ON
OFF
SW1
AN31
GND
AUTO WHITE
AUTO SET
VTR TRIG
ZEBRA ON/OFF

WITCHES•CONNECTORS BOARD SCHEMATIC DIAGRAM

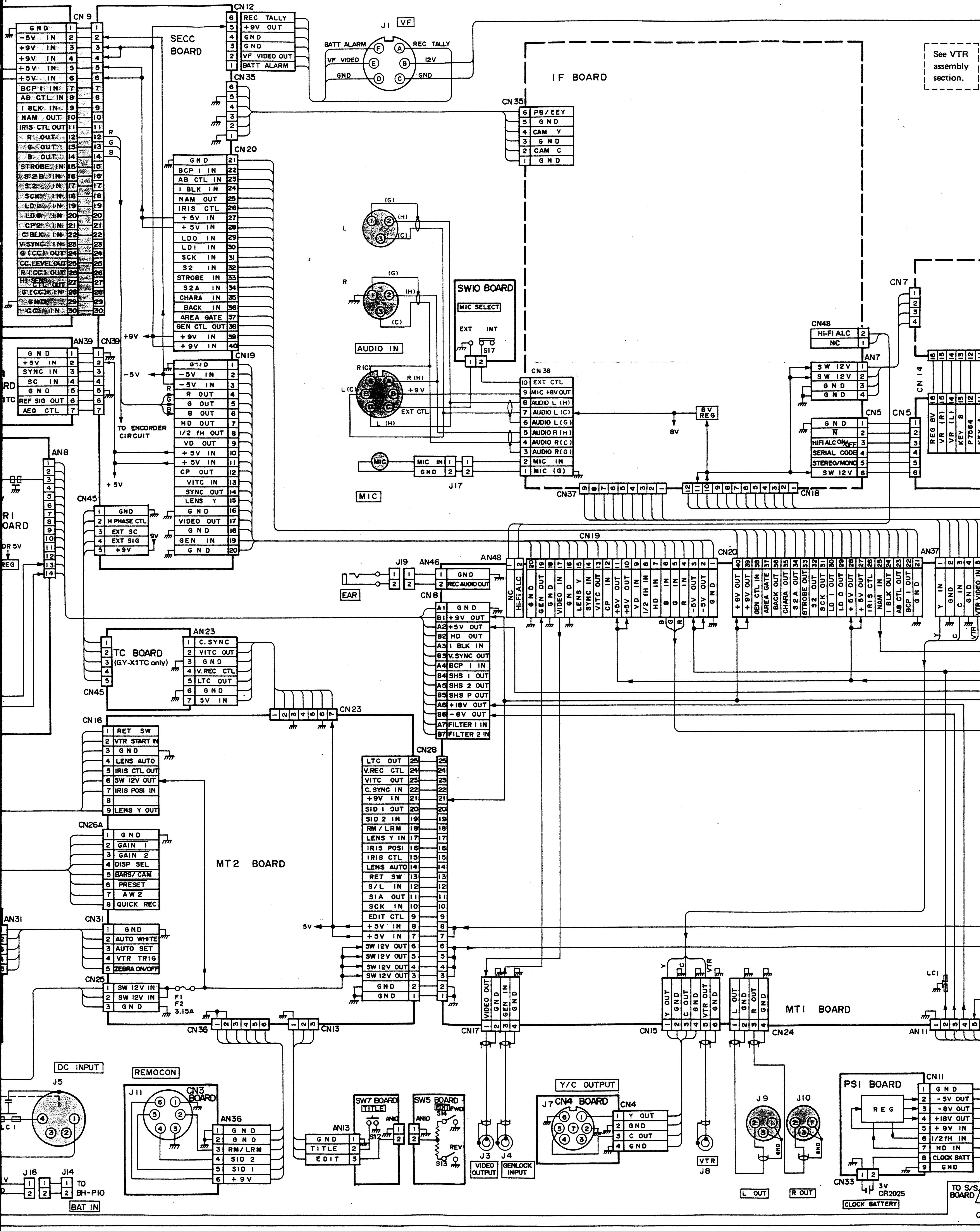

LENS
CN3
REMOCON
J11
SW4
S2
QUICK
POWER
SW9
ON
OFF
TO PS2 BOARD J13
CN2
S16
SEL 12V
J5
DC INPUT
LC1
AN34
AN40
+12V
GND
J16
J14
TO BH-P10
BAT IN
VIDEO OUTPUT
J3
J4
GENLOCK INPUT
AN16
AN36
AN25
CN52
GND
BKUP 12V
TO LD BOARD
CN16
RET SW
VTR START
GND
LENS AUTO
IRIS CTL
SW 12V OUT
IRIS POSI
NC
LENS Y OUT
CN36
GND
RM/LRM
SID2 OUT
SID1 IN
+9V OUT
CN25
SW 12V IN
C1 1000/25
F1, F2 3.15A
S6
AUTO1
AUTO2
RESET
BAL
IC 2
MC74HC165F
IC 1
MC74HC165F
SI
CLK INH
GND
VCC
S/L
CLK
QH
RA1 22K X 15
R1 22K
C3 47/6.3
CN23
TO TC BOARD
C.SYNC OUT
VITC IN
V.REC CTL OUT
LTC IN
+5V OUT
C2 0.1
CN28
CN 28
LTC IN
V.REC CTL OUT
VITC IN
SYNC OUT
+9V OUT
SID 1 IN
SID 2 OUT
RM CTL IN
LENS Y OUT
IRIS POSI IN
IRIS CTL OUT
LENS AUTO OUT
NOT USED
S/L OUT
SIA IN
SCK OUT
EDIT CTL IN
+5V OUT
SW +12V IN
GND
MT 2 board
MT1 board
CN8
TO DR1 BOARD
+9V OUT
DR +5V OUT
HD OUT
I. BLK IN
V. SYNC OUT
BCP1 IN
SHS1 OUT
SHD2 OUT
SHSP OUT
+18V OUT
- 8V OUT
Filter 1 IN
Filter 2 IN
CN19 · TO SECC BOARD
CN17
VIDEO OUT
VIDEO GND
GEN IN
GEN GND
GEN OUT
VIDEO IN
LENS Y IN
SYNC IN
VITC OUT
CP IN
+8V OUT
V.SYNC IN
1/2fH IN
HD IN
B IN
G IN
R IN
-5V OUT
TO CN8, 28
TO CN21
IC3
RC062M
+9V
R3 100K
R1 390K -5V
D1
HZ2ALL
C3 0.01
RA 1 22K X 8
IC 1
MC74HC165F
C1 0.1u
SHUTTER NOR
SHUTTER SEL
Filter1
Filter 2
RM CTL
PB CTL
GEN CTL
TO CN19
TO CN21
TO AN 18
TO CN28
TO CN19, 20
CN21
TO CP BOARD
SHUTTER SEL
SHUTTER NOR
VTR STATUS OUT
IRIS POSI OUT
REC AUDIO OUT
AB CTL IN
AREA GATE IN
BACK IN
CHARA IN
HD OUT
V.SYNC OUT
CP OUT
MODE1 IN
MODE0 IN
SID 2 IN
SID 1 OUT
LDO IN
STROBE IN
S/L IN
VTR TRIG
ZEBRA ON/OFF
SW7
TITLE
S12
AN 13
GND
TITLE ON/OFF
EDIT CTL
AN 10
S9
AUTO
S10
VTR TRIG
S11
ZEBRA
WHT
SETUP/BLK
ON
OFF
SW 1
AN31
AUTO WHITE
AUTO SET

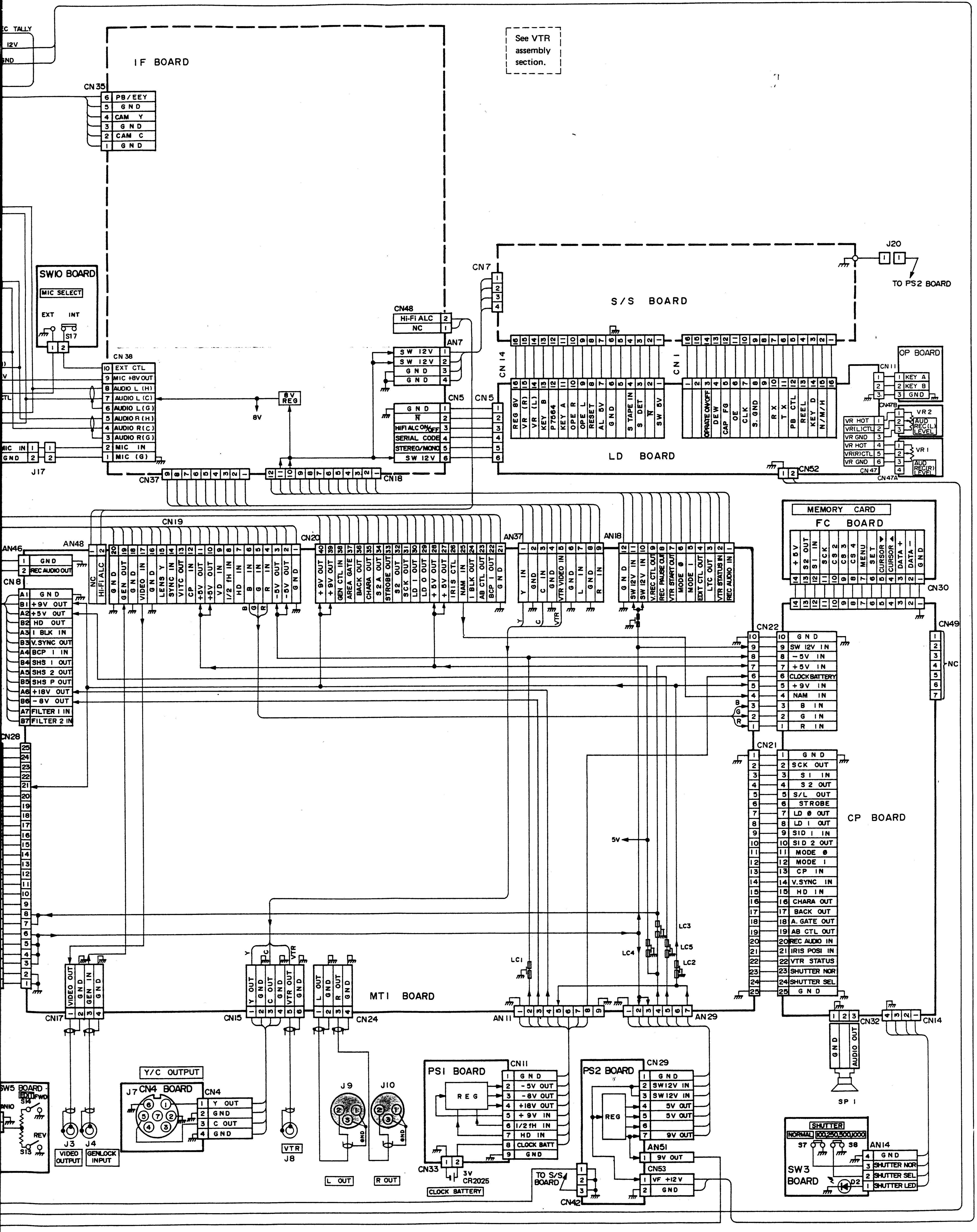

J5
DC INPUT
VIDEO OUTPUT
J3
J4
GENLOCK INPUT
J16
J14
+12V
GND
TO BH-P10
BAT IN
CN4
Y/C OUT
J7
AN15
VTR
L OUT
R OUT
J8
J9
J10
CN17
CN19 · TO SECC BOARD
CN20 TO SECC BOARD
AN37 TO IF BOARD
CN15
CN 24
L. OUT
GND
R. OUT
GND
AN11 TO PS1 BOARD
GND
-5V IN
-8V IN
+18V IN
+9V OUT
1/2fH OUT
HD OUT
CLOCK BATT
AN29 TO PS2 BOARD
SW +12V OUT
+5V IN
+9V IN
LC1
LC2
LC3
LC4
LC5
LC6
AN48
PB
HIFI ALC ON/OFF
AN46 TO J18
REC AUDIO OUT
R2 270
IC3 RC062M
R3 100K
RA1 22K X 8
R1 390K
-5V
+9V
D1 HZ2ALL
C3 0.01
IC1 MC74HC165F
IC2 MC14094BF
C1 0.1u
C2 0.1u
TO CN8, 28
TO AN18
TO CN22
TO CN21
TO AN11
TO CN19
TO CN19, 20
TO CN28
CN21 TO CP BOARD
CN22 TO CP BOARD
AN18 TO IF BOARD
MT1 board
CN 28

6.26 OVERALL WIRINGS



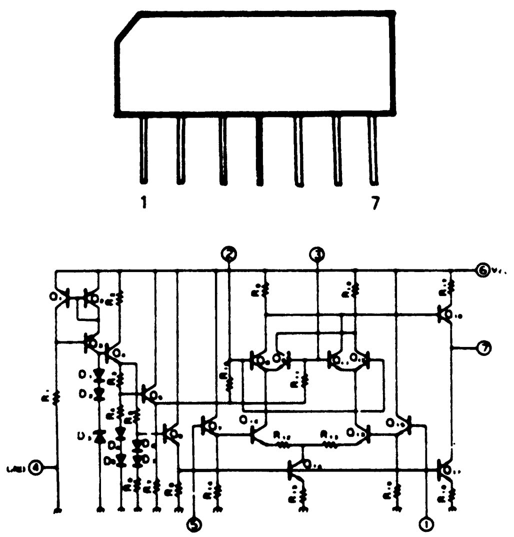
AN51
CN1
+5V OUT
B IN
GND
CN2
G IN
CN3
R IN
9V
5V
PR1 BOARD
CN9
GND
-5V IN
+9V IN
+5V IN
BCP 1 IN
AB CTL IN
I BLK IN
NAM OUT
IRIS CTL OUT
R OUT
G OUT
B OUT
STROBE IN
S2B IN
S2 IN
SCK IN
LD1 IN
LD0 IN
CP2 IN
C BLK IN
V SYNC IN
G (CC) OUT
CC LEVEL OUT
R (CC) OUT
HI SENS CTL OUT
G (CC) IN
GND
CC IN
SECC BOARD
CN12
REC TALLY
+9V OUT
GND
VF VIDEO OUT
BATT ALARM
CN35
CN20
BCP 1 IN
AB CTL IN
I BLK IN
NAM OUT
IRIS CTL
+5V IN
LDO IN
LD1 IN
SCK IN
S2 IN
STROBE IN
S2A IN
CHARA IN
BACK IN
AREA GATE
GEN CTL OUT
+9V IN
J1
VF
BATT ALARM
VF VIDEO
GND
REC
AN1
CN4
ISB
+15V
ØR
SUB
V1
V2
V3
V4
ØH1
ØH2
ØH2L
SHP
HP SHP
DR 5V
GND
AN2
CN5
ISG
CN6
ISR
AN3
RF1 BOARD (GY-X1TC only)
AN39
CN39
SYNC IN
SC IN
REF SIG OUT
AEQ CTL
+9V
-5V
TO ENCORDER CIRCUIT
+5V
CN19
-5V IN
R OUT
G OUT
B OUT
HD OUT
1/2 fH OUT
VD OUT
CP OUT
VITC IN
SYNC OUT
LENS Y
VIDEO OUT
GEN IN
CN45
H PHASE CTL
EXT SC
EXT SIG
AUDIO IN
EXT CTL
MIC
DR2 BOARD
CN4
CN5
CN6
CN7
5V IN
HD IN
I BLK OUT
V SYNC IN
BCP 1 OUT
SHS 1 IN
SHS 2 IN
SHS P IN
VH
VM
VL
+15V IN
B VSUB IN
G VSUB IN
R VSUB IN
V BCK OUT
Ø VSUB
SHP PH OUT
SHP PH IN
HP SHP OUT
HP SHP IN
AN8
DR1 BOARD
DR 5V
REG
CN27
FL BOARD
3200K
5600K
5600K+ND
FILTER 1 IN
FILTER 2 IN
J19
EAR
TC BOARD (GY-X1TC only)
AN23
C. SYNC
VITC OUT
V. REC CTL
LTC OUT
5V IN
CN23
LENS
J2
LENS Y
IRIS POSI
SW 12V
IRIS
LENS AUTO
GND
VTR START
RET SW
AN16
CN16
RET SW
VTR START IN
LENS AUTO
IRIS CTL OUT
SW 12V OUT
IRIS POSI IN
LENS Y OUT
CN26A
GAIN 1
GAIN 2
DISP SEL
BARS/CAM
PRESET
AW2
QUICK REC
MT2 BOARD
LTC OUT
V.REC CTL
VITC OUT
C.SYNC IN
+9V IN
SID 1 OUT
SID 2 IN
RM/LRM
LENS Y IN
IRIS POSI
IRIS CTL
LENS AUTO
RET SW
S/L IN
S1A OUT
SCK IN
EDIT CTL
+5V IN
SW 12V OUT
SW2 BOARD
AN26
S5
S6
AUTO1
AUTO2
CAM
BAR
S3
S4
PRESET
GAIN
MODE
DISP SELECT
W. BAL
SW1 BOARD
AN31
WHT
S9
S10
S11
ON
SETUP /BLK
OFF
AUTO
VTR TRIG
ZEBRA
CN31
AUTO WHITE
AUTO SET
VTR TRIG
ZEBRA ON/OFF
CN25
SW 12V IN
F1
F2
3.15A
CN36
CN13
DC INPUT
J5
REMOCON
J11
CN3 BOARD
AN36
AN26B
SW4 BOARD
S2
QUICK
AN25
ON
OFF
S1
POWER
SW9 BOARD
CN34
SW 12V
CN52
BKUP 12V OUT
AN34
CN2 BOARD
S16
LC1
AN40
+12V
J16
J14
TO BH-P10
BAT IN
SW7 BOARD
TITLE
AN13
S12
EDIT


CN 9
GND
-5V IN
+9V IN
+9V IN
+5V IN
+5V IN
BCP I IN
AB CTL IN
I BLK IN
NAM OUT
IRIS CTL OUT
R OUT
G OUT
B OUT
STROBE IN
S2B IN
S2 IN
SCK IN
LDO IN
LDI IN
CP2 IN
C BLK IN
V.SYNC IN
G (CC) OUT
CC.LEVEL OUT
R (CC) OUT
HI SENS CTL OUT
G (CC) IN
GND
CC IN
SECC BOARD
CN12
REC TALLY
+9V OUT
GND
GND
VF VIDEO OUT
BATT ALARM
CN35
CN20
GND
BCP I IN
AB CTL IN
I BLK IN
NAM OUT
IRIS CTL
+5V IN
+5V IN
LDO IN
LDI IN
SCK IN
S2 IN
STROBE IN
S2A IN
CHARA IN
BACK IN
AREA GATE
GEN CTL OUT
+9V IN
+9V IN
CN19
GND
-5V IN
-5V IN
R OUT
G OUT
B OUT
HD OUT
1/2 fH OUT
VD OUT
+5V IN
+5V IN
CP OUT
VITC IN
SYNC OUT
LENS Y
GND
VIDEO OUT
GND
GEN IN
GND
AN39
CN39
GND
+5V IN
SYNC IN
SC IN
GND
REF SIG OUT
AEQ CTL
-5V
+9V
TO ENCORDER CIRCUIT
+5V
AN8
CN45
GND
H PHASE CTL
EXT SC
EXT SIG
+9V
9V
J1 VF
BATT ALARM
REC TALLY
VF VIDEO
12V
GND
GND
IF BOARD
See VTR assembly section.
CN35
PB/EEY
GND
CAM Y
GND
CAM C
GND
L
R
AUDIO IN
SW10 BOARD
MIC SELECT
EXT INT
S17
CN 38
EXT CTL
MIC +8V OUT
AUDIO L (H)
AUDIO L (C)
AUDIO L (G)
AUDIO R (H)
AUDIO R (C)
AUDIO R (G)
MIC IN
MIC (G)
R (H)
+9V
EXT CTL
L (H)
MIC
MIC IN
GND
J17
8V REG
8V
CN37
CN18
CN48
Hi-Fi ALC
NC
AN7
SW 12V
SW 12V
GND
GND
CN5
GND
N̄
HIFI ALC ON/OFF
SERIAL CODE
STEREO/MONO
SW 12V
CN7
CN 14
REG 8V
VR (R)
VR (L)
KEY B
P7564
CN19
CN20
AN37
AN48
NC
Hi-Fi ALC
GND
GEN OUT
GND
VIDEO IN
GND
LENS Y
SYNC IN
VITC OUT
CP IN
+5V OUT
+5V OUT
VD IN
1/2 fH IN
HD IN
B IN
G IN
R IN
-5V OUT
-5V OUT
GND
+9V OUT
+9V OUT
GEN CTL IN
AREA GATE
BACK OUT
CHARA OUT
S2A OUT
STROBE OUT
S2 OUT
SCK OUT
LD I OUT
LD O OUT
+5V OUT
+5V OUT
IRIS CTL
NAM IN
I BLK OUT
AB CTL OUT
BCP I OUT
GND
Y IN
GND
C IN
GND
VTR VIDEO IN
J19
AN46
GND
REC AUDIO OUT
EAR
CN8
GND
+9V OUT
+5V OUT
HD OUT
I BLK IN
V.SYNC OUT
BCP I IN
SHS 1 OUT
SHS 2 OUT
SHS P OUT
+18V OUT
-8V OUT
FILTER 1 IN
FILTER 2 IN
AN23
TC BOARD (GY-X1TC only)
C.SYNC
VITC OUT
GND
V.REC CTL
LTC OUT
GND
5V IN
CN45
CN23
CN16
RET SW
VTR START IN
GND
LENS AUTO
IRIS CTL OUT
SW 12V OUT
IRIS POSI IN
LENS Y OUT
CN26A
GND
GAIN 1
GAIN 2
DISP SEL
BARS/CAM
PRESET
AW2
QUICK REC
MT2 BOARD
AN31
CN31
GND
AUTO WHITE
AUTO SET
VTR TRIG
ZEBRA ON/OFF
CN25
SW 12V IN
SW 12V IN
GND
F1 F2 3.15A
CN28
LTC OUT
V.REC CTL
VITC OUT
C.SYNC IN
+9V IN
SID 1 OUT
SID 2 IN
RM/LRM
LENS Y IN
IRIS POSI
IRIS CTL
LENS AUTO
RET SW
S/L IN
SIA OUT
SCK IN
EDIT CTL
+5V IN
+5V IN
SW 12V OUT
SW 12V OUT
SW 12V OUT
SW 12V OUT
GND
GND
5V
CN36
CN13
CN17
VIDEO OUT
GND
GEN IN
GND
CN15
Y OUT
GND
C OUT
GND
VTR OUT
GND
L OUT
GND
R OUT
GND
CN24
MT1 BOARD
LC1
AN 11
DC INPUT
J5
REMOCON
J11
CN3 BOARD
AN36
GND
GND
RM/LRM
SID 2
SID 1
+9V
J16
J14
TO BH-P10
BAT IN
SW7 BOARD TITLE
AN13
GND
TITLE
EDIT
S12
SW5 BOARD EDIT
AN10
S14 FWD
REV
S13
J3
J4
VIDEO OUTPUT
GENLOCK INPUT
Y/C OUTPUT
J7 CN4 BOARD
CN4
Y OUT
GND
C OUT
GND
J8
VTR
J9
J10
L OUT
R OUT
PS1 BOARD
REG
CN11
GND
-5V OUT
-8V OUT
+18V OUT
+9V IN
1/2 fH IN
HD IN
CLOCK BATT
GND
CN33
3V CR2025
CLOCK BATTERY
TO S/S BOARD

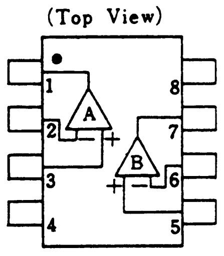

IF BOARD
See VTR assembly section.
CN35
PB/EEY
GND
CAM Y
CAM C
SW10 BOARD
MIC SELECT
EXT
INT
S17
CN38
EXT CTL
MIC +8V OUT
AUDIO L (H)
AUDIO L (C)
AUDIO L (G)
AUDIO R (H)
AUDIO R (C)
AUDIO R (G)
MIC IN
MIC (G)
J17
8V REG
8V
CN48
Hi-Fi ALC
NC
AN7
SW 12V
CN5
HIFI ALC ON/OFF
SERIAL CODE
STEREO/MONO
CN37
CN18
CN7
S/S BOARD
J20
TO PS2 BOARD
CN14
CN1
REG 8V
VR (R)
VR (L)
KEY B
P7564
KEY A
OPE R
OPE L
RESET
AL 5V
S TAPE IN
S DET
SW 5V
OPRATE ON/OFF
DEW
CAP FG
OE
CLK
S. GND
RX
TX
PB CTL
REEL
KEY D
N/M/H
LD BOARD
OP BOARD
CN11
KEY A
KEY B
CN47B
VR 2
AUD REC(L) LEVEL
VR HOT
VR(L)CTL
VR GND
VR(R)CTL
VR 1
AUD REC(R) LEVEL
CN47
CN47A
CN52
CN19
CN20
AN37
AN18
AN48
AN46
REC AUDIO OUT
CN8
+9V OUT
+5V OUT
HD OUT
I BLK IN
V.SYNC OUT
BCP 1 IN
SHS 1 OUT
SHS 2 OUT
SHS P OUT
+18V OUT
-8V OUT
FILTER 1 IN
FILTER 2 IN
CN28
Hi-Fi ALC
GEN OUT
VIDEO IN
VIDEO OUT
LENS Y
SYNC IN
VITC OUT
CP IN
VD IN
1/2 fH IN
HD IN
B IN
G IN
R IN
-5V OUT
GEN CTL IN
AREA GATE
BACK OUT
CHARA OUT
S2A OUT
STROBE OUT
S2 OUT
SCK OUT
LD 1 OUT
LD 0 OUT
IRIS CTL
NAM IN
I BLK OUT
AB CTL OUT
BCP 1 OUT
Y IN
C IN
VTR VIDEO IN
L IN
R IN
SW 12V IN
V.REC CTL OUT
REC PAUSE OUT
VTR START OUT
MODE 0
MODE 1
EDIT CTL OUT
LTC OUT
VTR STATUS IN
REC AUDIO IN
MEMORY CARD
FC BOARD
S2 OUT
SI IN
SCK
CS 2
CS 3
CS 4
MENU
SET
CURSOR
DATA +
DATA -
CN30
CN49
NC
CN22
-5V IN
+5V IN
CLOCK BATTERY
+9V IN
NAM IN
CN21
SCK OUT
SI IN
S2 OUT
S/L OUT
STROBE
LD 0 OUT
LD 1 OUT
SID 1 IN
SID 2 OUT
MODE 0
MODE 1
CP IN
V.SYNC IN
HD IN
CHARA OUT
BACK OUT
A. GATE OUT
AB CTL OUT
REC AUDIO IN
IRIS POSI IN
VTR STATUS
SHUTTER NOR
SHUTTER SEL
CP BOARD
5V
LC1
LC2
LC3
LC4
LC5
MT1 BOARD
CN17
GEN IN
CN15
Y OUT
C OUT
VTR OUT
CN24
L OUT
R OUT
AN11
AN29
CN32
CN14
AUDIO OUT
SP 1
SW5 BOARD
EDIT
FWD
S14
REV
S13
Y/C OUTPUT
J7
CN4 BOARD
CN4
J3
J4
VIDEO OUTPUT
GENLOCK INPUT
VTR
J8
J9
J10
L OUT
R OUT
PS1 BOARD
REG
+18V OUT
+9V IN
1/2fH IN
CLOCK BATT
CN33
3V
CR2025
CLOCK BATTERY
PS2 BOARD
CN29
SW12V IN
5V OUT
9V OUT
AN51
CN53
VF +12V
TO S/S BOARD
CN42
SHUTTER
NORMAL
100,250,500,1000
S7
S8
AN14
SHUTTER NOR
SHUTTER SEL
SHUTTER LED
SW3 BOARD
D2

6.27 BLOCK DIAGRAMS OF PRINCIPLE ICs

AN614 [MATSUSHITA]
(Balance Modulator)

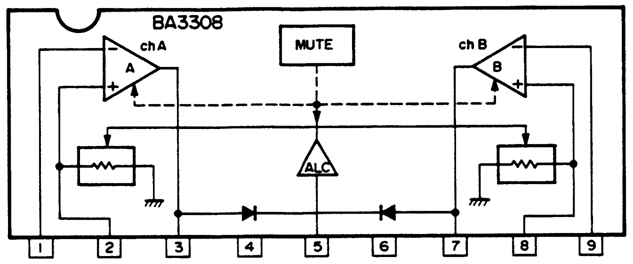


BA10393F [ROHM]
(Dual Comparator)

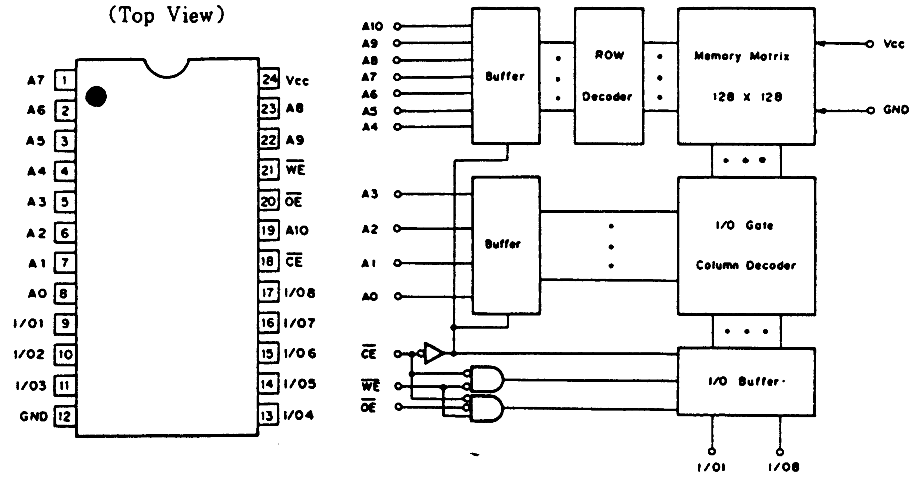

(Top View)
1
2
3
4
5
6
7
8
A
B

Pin
1. A OUTPUT
2. A–INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B–INPUT
7. B OUTPUT
8. V⁺

BA3308 [ROHM]

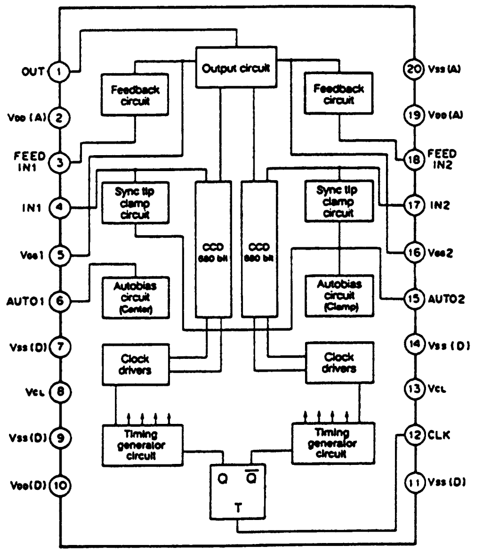

BA3308
chA
MUTE
ch B
A
B
ALC
1
2
3
4
5
6
7
8
9

CXK5816M-15-T6 [SONY]
(2048-word x 8 bit CMOS Static RAM)

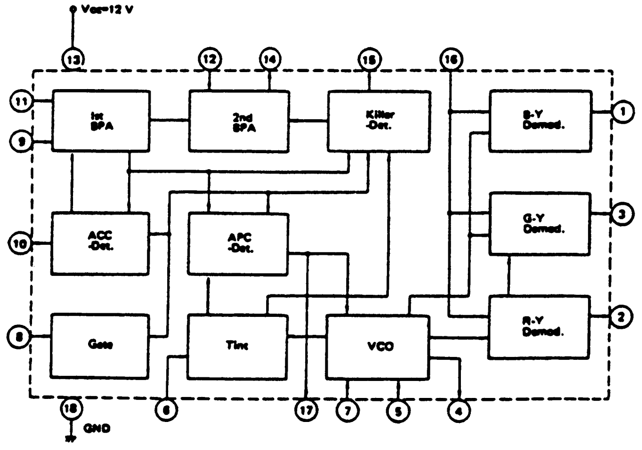

(Top View)
A7 1
A6 2
A5 3
A4 4
A3 5
A2 6
A1 7
A0 8
I/O1 9
I/O2 10
I/O3 11
GND 12
24 Vcc
23 A8
22 A9
21 WE
20 OE
19 A10
18 CE
17 I/O8
16 I/O7
15 I/O6
14 I/O5
13 I/O4
A10
A9
A8
A7
A6
A5
A4
Buffer
ROW Decoder
Memory Matrix 128 X 128
Vcc
GND
A3
A2
A1
A0
Buffer
I/O Gate
Column Decoder
CE
WE
OE
I/O Buffer
I/O1
I/O8

Pin Symbol	Description
A0 – A10	Address IN
I/O1 – I/O8	DATA IN/OUT
$\overline{\text{CE}}$	Chip Enable IN
$\overline{\text{WE}}$	Write Enable IN
$\overline{\text{OE}}$	Output Enable IN
Vcc	+5 V Power
GND	GND

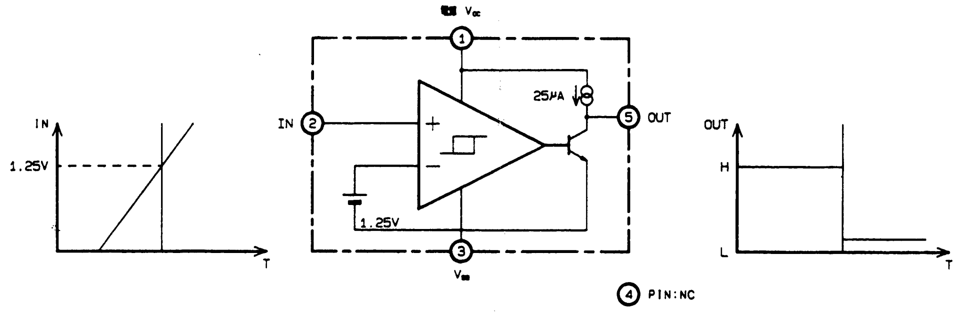
CXL1009P [SONY]
(CCD Signal Processor for TBC)


OUT 1
VDD (A) 2
FEED IN1 3
IN1 4
VGG1 5
AUTO1 6
VSS (D) 7
VCL 8
VSS (D) 9
VDD (D) 10
20 VSS (A)
19 VDD (A)
18 FEED IN2
17 IN2
16 VGG2
15 AUTO2
14 VSS (D)
13 VCL
12 CLK
11 VSS (D)
Output circuit
Feedback circuit
Feedback circuit
Sync tip clamp circuit
Sync tip clamp circuit
CCD 680 bit
CCD 680 bit
Autobias circuit (Center)
Autobias circuit (Clamp)
Clock drivers
Clock drivers
Timing generator circuit
Timing generator circuit
Q
Q̄
T

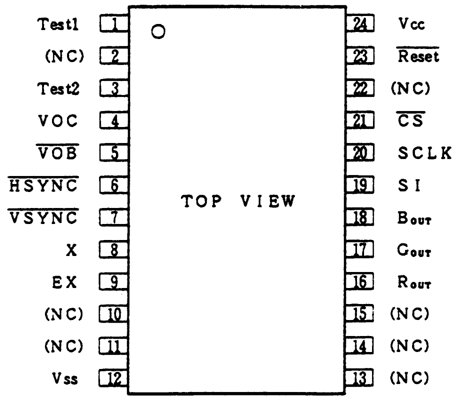
HA11247MP [HITACHI]
(TV Synchronours Processor)


Vcc=12 V
13
12
14
15
16
11
9
10
8
18
GND
6
17
7
5
4
1
3
2
1st BPA
2nd BPA
Killer -Det.
B-Y Demod.
ACC -Det.
APC -Det.
G-Y Demod.
Gate
Tint
VCO
R-Y Demod.

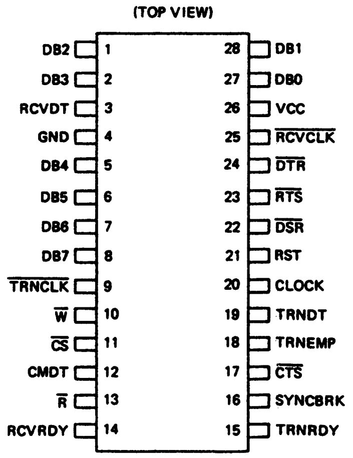
M51946APF [MITSUBISHI]
(Voltage Detecting type System Reset)


IN
1.25V
T
Vcc
①
IN ②
25μA
⑤ OUT
+
−
1.25V
③
Vss
④ PIN:NC
OUT
H
L
T

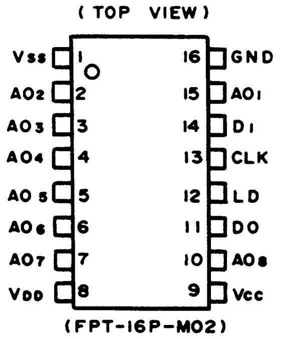
MB89012-109 [FUJITSU]
(TV Display Controler)

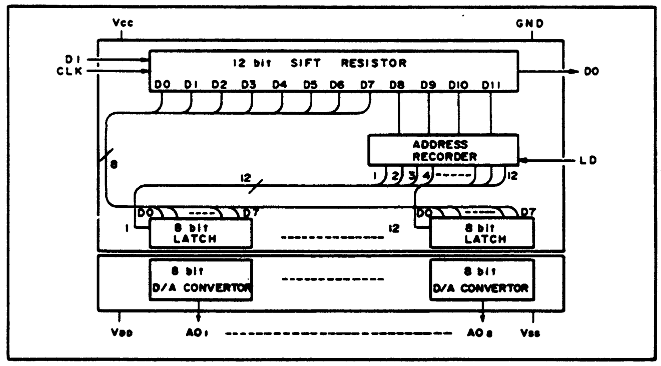

Test1 1
(NC) 2
Test2 3
VOC 4
$\overline{VOB}$ 5
$\overline{HSYNC}$ 6
$\overline{VSYNC}$ 7
X 8
EX 9
(NC) 10
(NC) 11
Vss 12
TOP VIEW
24 Vcc
23 $\overline{Reset}$
22 (NC)
21 $\overline{CS}$
20 SCLK
19 SI
18 B_{OUT}
17 G_{OUT}
16 R_{OUT}
15 (NC)
14 (NC)
13 (NC)

MB89251APF [FUJITSU]
(Serial Data Transmiter/Reciever)

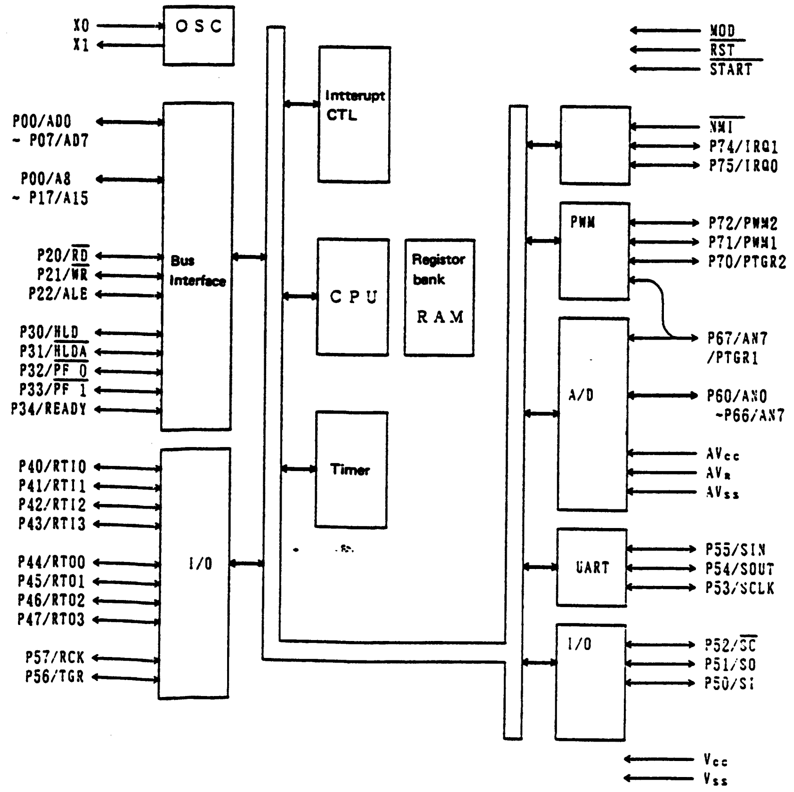

(TOP VIEW)
DB2 1
DB3 2
RCVDT 3
GND 4
DB4 5
DB5 6
DB6 7
DB7 8
$\overline{TRNCLK}$ 9
$\overline{W}$ 10
$\overline{CS}$ 11
CMDT 12
$\overline{R}$ 13
RCVRDY 14
28 DB1
27 DB0
26 VCC
25 $\overline{RCVCLK}$
24 $\overline{DTR}$
23 $\overline{RTS}$
22 $\overline{DSR}$
21 RST
20 CLOCK
19 TRNDT
18 TRNEMP
17 $\overline{CTS}$
16 SYNCBRK
15 TRNRDY

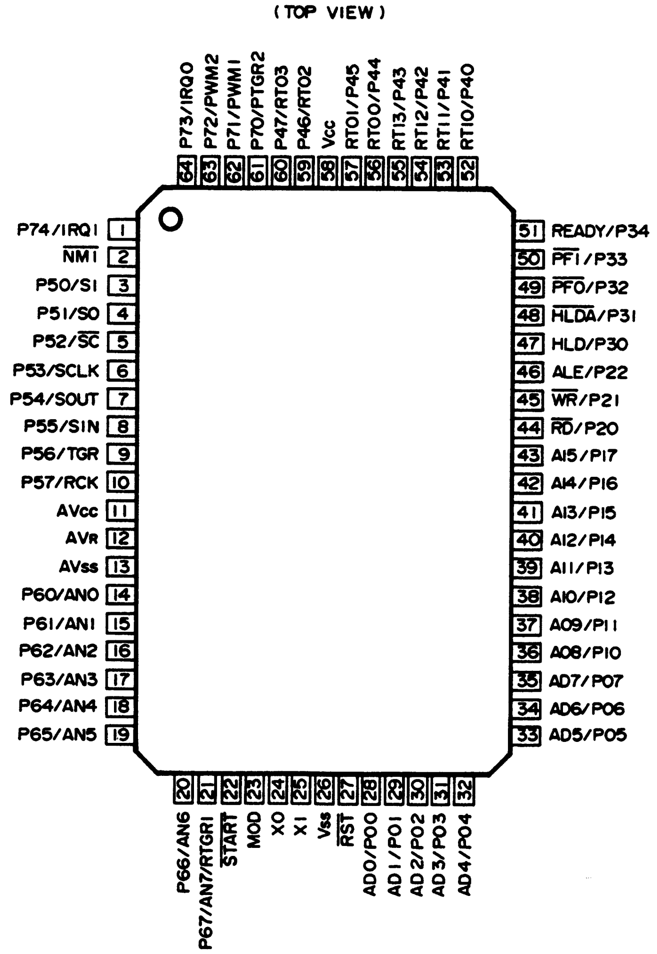
MB88342PF [FUJITSU]
(D/A Converter)


(TOP VIEW)
Vss 1
AO2 2
AO3 3
AO4 4
AO5 5
AO6 6
AO7 7
VDD 8
16 GND
15 AO1
14 DI
13 CLK
12 LD
11 DO
10 AO8
9 Vcc
(FPT-16P-M02)

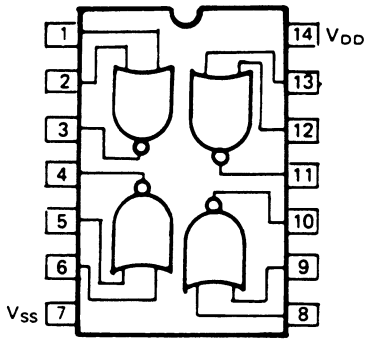

Vcc
GND
DI
CLK
12 bit SIFT RESISTOR
D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11
DO
ADDRESS RECORDER
LD
8
12
1 2 3 4 12
D0 D7
1
8 bit LATCH
12
D0 D7
8 bit LATCH
8 bit D/A CONVERTOR
8 bit D/A CONVERTOR
VDD
AO1
AO8
Vss

MB89T715PF [FUJITSU]
(8-bit Microcomputer)

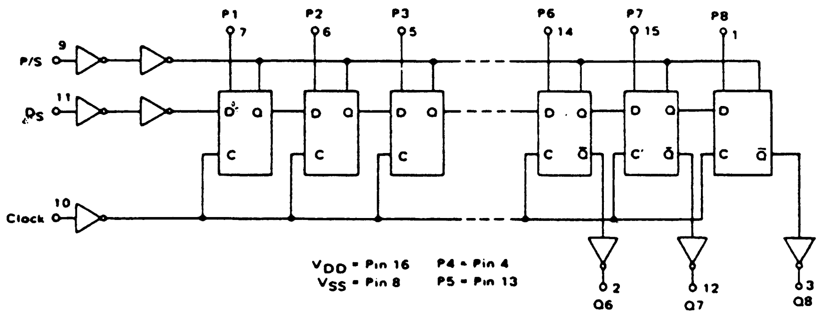

X0
X1
OSC
P00/AD0 ~ P07/AD7
P00/A8 ~ P17/A15
P20/$\overline{RD}$
P21/$\overline{WR}$
P22/ALE
P30/$\overline{HLD}$
P31/$\overline{HLDA}$
P32/$\overline{PF\ 0}$
P33/$\overline{PF\ 1}$
P34/READY
Bus Interface
P40/RTI0
P41/RTI1
P42/RTI2
P43/RTI3
P44/RTO0
P45/RTO1
P46/RTO2
P47/RTO3
P57/RCK
P56/TGR
I/O
Intterupt CTL
CPU
Registor bank
RAM
Timer
MOD
$\overline{RST}$
$\overline{START}$
$\overline{NMI}$
P74/IRQ1
P75/IRQ0
PWM
P72/PWM2
P71/PWM1
P70/PTGR2
P67/AN7 /PTGR1
A/D
P60/AN0 ~P66/AN7
AVcc
AVR
AVss
UART
P55/SIN
P54/SOUT
P53/SCLK
I/O
P52/$\overline{SC}$
P51/SO
P50/SI
Vcc
Vss


(TOP VIEW)
P74/IRQ1 1
$\overline{NMI}$ 2
P50/SI 3
P51/SO 4
P52/$\overline{SC}$ 5
P53/SCLK 6
P54/SOUT 7
P55/SIN 8
P56/TGR 9
P57/RCK 10
AVcc 11
AVR 12
AVss 13
P60/AN0 14
P61/AN1 15
P62/AN2 16
P63/AN3 17
P64/AN4 18
P65/AN5 19
20 P66/AN6
21 P67/AN7/RTGR1
22 $\overline{START}$
23 MOD
24 X0
25 X1
26 Vss
27 $\overline{RST}$
28 AD0/P00
29 AD1/P01
30 AD2/P02
31 AD3/P03
32 AD4/P04
33 AD5/P05
34 AD6/P06
35 AD7/P07
36 A08/P10
37 A09/P11
38 A10/P12
39 A11/P13
40 A12/P14
41 A13/P15
42 A14/P16
43 A15/P17
44 $\overline{RD}$/P20
45 $\overline{WR}$/P21
46 ALE/P22
47 HLD/P30
48 $\overline{HLDA}$/P31
49 $\overline{PF0}$/P32
50 $\overline{PF1}$/P33
51 READY/P34
52 RTI0/P40
53 RTI1/P41
54 RTI2/P42
55 RTI3/P43
56 RTO0/P44
57 RTO1/P45
58 Vcc
59 P46/RTO2
60 P47/RTO3
61 P70/PTGR2
62 P71/PWM1
63 P72/PWM2
64 P73/IRQ0

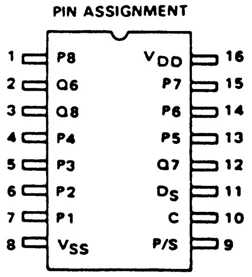
MC14001BF [MOTROLA]
(Quad. NOR Gate)


1
2
3
4
5
6
VSS 7
14 VDD
13
12
11
10
9
8

MC14021BF/BCP [MOTROLA]


P1 7
P2 6
P3 5
P6 14
P7 15
P8 1
P/S 9
DS 11
Clock 10
D Q
C
D Q̄
C Q̄
VDD = Pin 16
VSS = Pin 8
P4 = Pin 4
P5 = Pin 13
2 Q6
12 Q7
3 Q8

PIN ASSIGNMENT

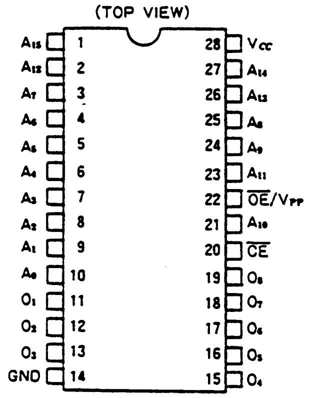

1 P8
2 Q6
3 Q8
4 P4
5 P3
6 P2
7 P1
8 VSS
VDD 16
P7 15
P6 14
P5 13
Q7 12
DS 11
C 10
P/S 9

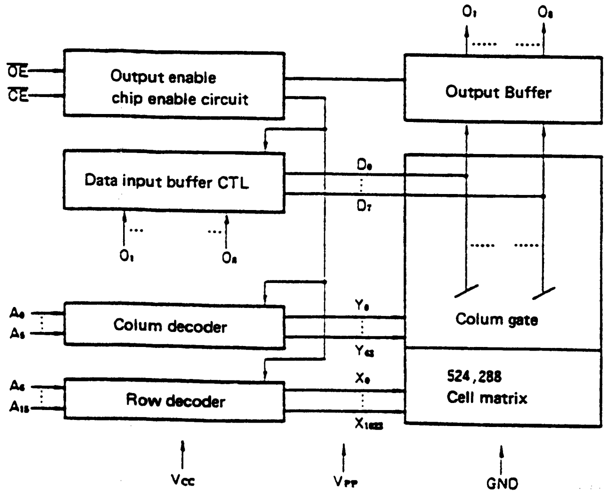
TRUTH TABLE
SERIAL OPERATION:

t	CLOCK	D_S	P/S	Q6 t = n+6	Q7 t = n+7	Q8 t = n+8
n	↑	0	0	0	?	?
n+1	↑	1	0	1	0	?
n+2	↑	0	0	0	1	0
n+3	↑	1	0	1	0	1
	↓	X	0	Q6	Q7	Q8

*Q6, Q7, & Q8 are available externally
X = Don't Care

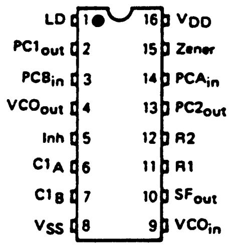
PLSC1038 [JVC]
(512 K-bit One Time PROM)

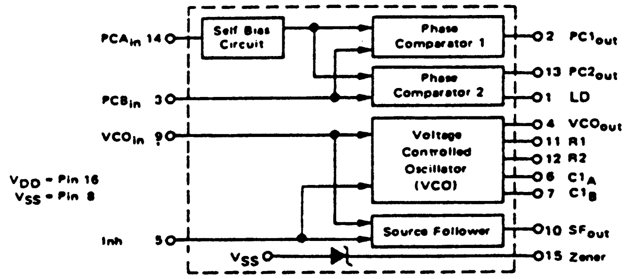

(TOP VIEW)
A15 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
O1 11
O2 12
O3 13
GND 14
28 Vcc
27 A14
26 A13
25 A8
24 A9
23 A11
22 OE/VPP
21 A10
20 CE
19 O8
18 O7
17 O6
16 O5
15 O4


OE
CE
Output enable chip enable circuit
Output Buffer
O1
O8
Data input buffer CTL
D0
D7
O1
O8
A0
A5
Colum decoder
Y0
Y63
Colum gate
A6
A15
Row decoder
X0
X1023
524,288 Cell matrix
Vcc
VPP
GND

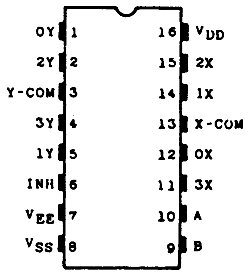
MC14046BF [MOTROLA]
(Phase-locked Loop)

PIN ASSIGNMENT


LD 1
PC1out 2
PCBin 3
VCOout 4
Inh 5
C1A 6
C1B 7
VSS 8
16 VDD
15 Zener
14 PCAin
13 PC2out
12 R2
11 R1
10 SFout
9 VCOin

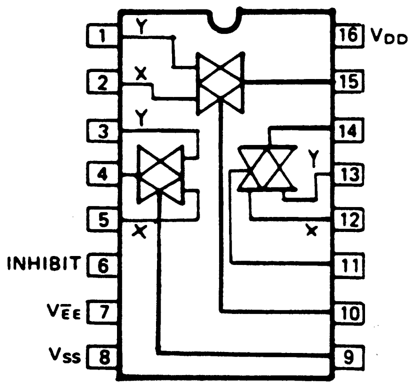

PCAin 14
PCBin 3
VCOin 9
Inh 5
VDD = Pin 16
VSS = Pin 8
Self Bias Circuit
Phase Comparator 1
Phase Comparator 2
Voltage Controlled Oscillator (VCO)
Source Follower
VSS
2 PC1out
13 PC2out
1 LD
4 VCOout
11 R1
12 R2
6 C1A
7 C1B
10 SFout
15 Zener

MC14052BF [MOTROLA]
(Differential 4-Ch Multiplexer/Demultiplexer)


0Y 1
2Y 2
Y-COM 3
3Y 4
1Y 5
INH 6
VEE 7
VSS 8
16 VDD
15 2X
14 1X
13 X-COM
12 0X
11 3X
10 A
9 B

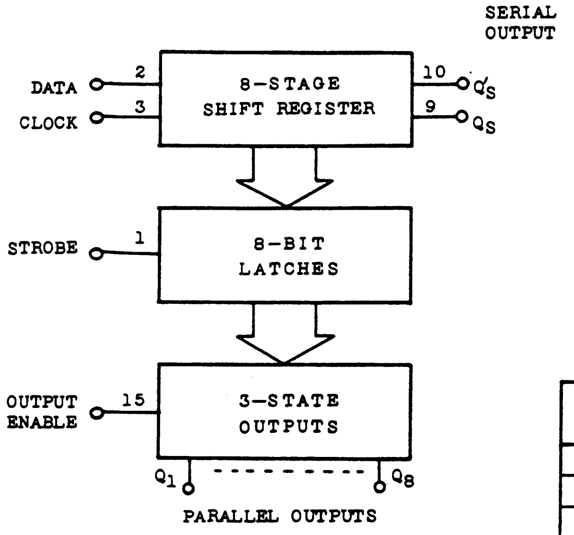
INPUT STATES			"ON" CHANNEL(S)
INHIBIT	B	A	
0	0	0	0x, 0y
0	0	1	1x, Iy
0	1	0	2x, 2y
0	1	1	3x, 3y
1	X	X	NONE

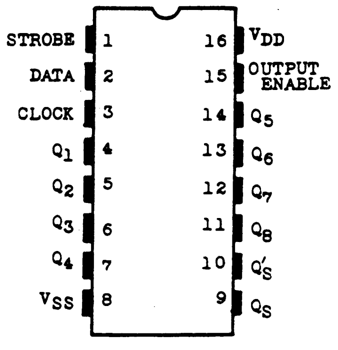
MC14053BF [MOTROLA]
(Multiplexer/Demultiplexer)


1
2
3
4
5
INHIBIT 6
VEE 7
VSS 8
16 VDD
15
14
13
12
11
10
9
Y
X
Y
X
Y
X

CONTROL H : Y OUTPUT

MC14094BF [MOTROLA]
(8-Stage Shift-And-Store Bus Register)


SERIAL OUTPUT
DATA 2
CLOCK 3
8-STAGE SHIFT REGISTER
10 Q'S
9 QS
STROBE 1
8-BIT LATCHES
OUTPUT ENABLE 15
3-STATE OUTPUTS
Q1 Q8
PARALLEL OUTPUTS

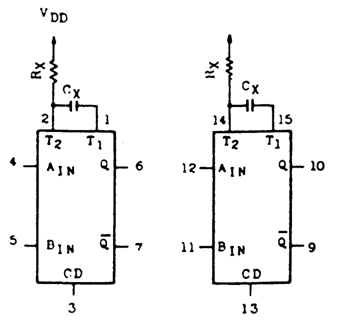

STROBE 1
DATA 2
CLOCK 3
Q1 4
Q2 5
Q3 6
Q4 7
VSS 8
16 VDD
15 OUTPUT ENABLE
14 Q5
13 Q6
12 Q7
11 Q8
10 Q'S
9 QS

(TOP VIEW)

CL	OE	ST	D	PO		SO	
				Q_1	Q_n	Q_S	Q'_S
⎍	H	H	L	L	Q_n-1	Q_7	NC
⎍	H	H	H	H	Q_n-1	Q_7	NC
⎍	H	L	*	NC	NC	Q_7	NC
⎍	L	*	*	HZ	HZ	Q_7	NC
⎎	H	*	*	NC	NC	NC	Q_S
⎎	L	*	*	HZ	HZ	NC	Q_S

CL=Clock
OE=Output Enable
ST=Strobe
D =Data
PO=Parallel Outputs
SO=Serial Output
* =Don't care
NC=No Change
HZ=High Impedance

MC14538BF [MOTROLA]
(Retriggerable/Resettable Mono-Multi)


VDD
Rx
Cx
2 1
T2 T1
4 AIN Q 6
5 BIN Q̄ 7
CD
3
14 15
12 AIN Q 10
11 BIN Q̄ 9
CD
13

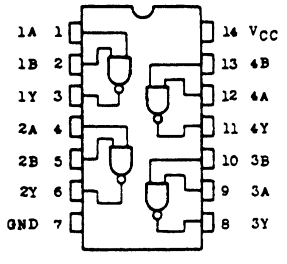
V_{DD} : 16, V_{SS} : 8

Output (Q, $\overline{Q}$) Pulse width = Rx•Cx

INPUT			OUTPUT		NOTE
A	B	CD	Q	$\overline{Q}$	
⎍	H	H	⎍⎍	⎎⎍	OUTPUT PULSE
⎍	L	H	L	H	INHIBIT
H	⎎	H	L	H	INHIBIT
L	⎎	H	⎍⎍	⎎⎍	OUTPUT PULSE
*	*	L	L	H	INHIBIT

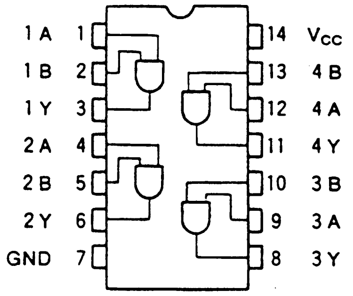
* DON'T CARE

MC74HC00AF [MOTROLA]
(Quad 2-Input NAND Gate)


1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

(TOP VIEW)

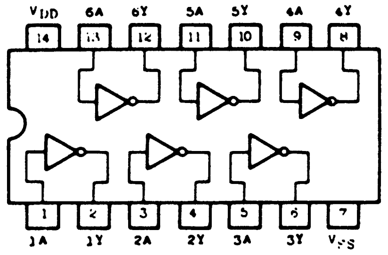
MC74HC08F [MOTROLA]
(Quad 2-Input AND Gate)


1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

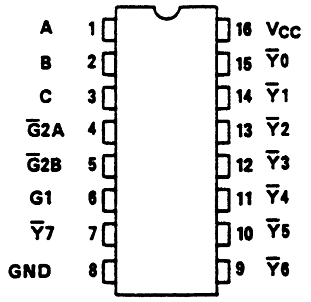
(TOP VIEW)

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

MC74HC04AF [MOTROLA]
(Hex Buffer/Converter Inverting type)


VDD 6A 6Y 5A 5Y 4A 4Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1Y 2A 2Y 3A 3Y VSS

MC74HC138AF [MOTROLA]
(3-To-8 Line Decorder)

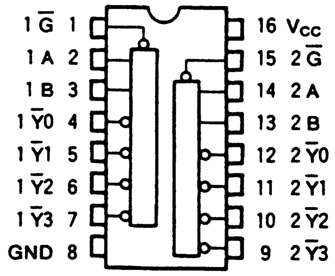

A 1
B 2
C 3
G̅2A 4
G̅2B 5
G1 6
Y̅7 7
GND 8
16 Vcc
15 Y̅0
14 Y̅1
13 Y̅2
12 Y̅3
11 Y̅4
10 Y̅5
9 Y̅6

(TOP VIEW)

INPUTS						OUTPUTS								SELECTED OUTPUT
ENABLE			SELECT											
G1	$\overline{G2A}$	$\overline{G2B}$	C	B	A	$\overline{Y0}$	$\overline{Y1}$	$\overline{Y2}$	$\overline{Y3}$	$\overline{Y4}$	$\overline{Y5}$	$\overline{Y6}$	$\overline{Y7}$	
L	X	X	X	X	X	H	H	H	H	H	H	H	H	NONE
X	H	X	X	X	X	H	H	H	H	H	H	H	H	NONE
X	X	H	X	X	X	H	H	H	H	H	H	H	H	NONE
H	L	L	L	L	L	L	H	H	H	H	H	H	H	$\overline{Y0}$
H	L	L	L	L	H	H	L	H	H	H	H	H	H	$\overline{Y1}$
H	L	L	L	H	L	H	H	L	H	H	H	H	H	$\overline{Y2}$
H	L	L	L	H	H	H	H	H	L	H	H	H	H	$\overline{Y3}$
H	L	L	H	L	L	H	H	H	H	L	H	H	H	$\overline{Y4}$
H	L	L	H	L	H	H	H	H	H	H	L	H	H	$\overline{Y5}$
H	L	L	H	H	L	H	H	H	H	H	H	L	H	$\overline{Y6}$
H	L	L	H	H	H	H	H	H	H	H	H	H	L	$\overline{Y7}$

X : DONT' CARE

MC74HC139AF [MOTROLA]
(Dual 2-To-4 Line Decorder)

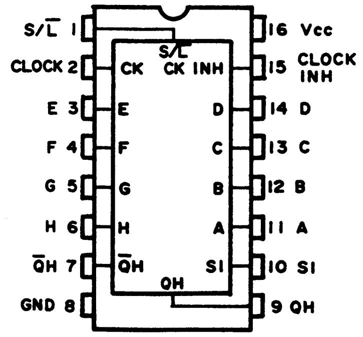

1G̅ 1
1A 2
1B 3
1Y̅0 4
1Y̅1 5
1Y̅2 6
1Y̅3 7
GND 8
16 Vcc
15 2G̅
14 2A
13 2B
12 2Y̅0
11 2Y̅1
10 2Y̅2
9 2Y̅3

(TOP VIEW)

INPUTS			OUTPUTS				SELECTED OUTPUT
ENABLE	SELECT		$\overline{Y0}$	$\overline{Y1}$	$\overline{Y2}$	$\overline{Y3}$	
$\overline{G}$	B	A					
H	X	X	H	H	H	H	NONE
L	L	L	L	H	H	H	$\overline{Y0}$
L	L	H	H	L	H	H	$\overline{Y1}$
L	H	L	H	H	L	H	$\overline{Y2}$
L	H	H	H	H	H	L	$\overline{Y3}$

X : Don't care

MC74HC165F [MOTROLA]
(8-bit Shift Register)

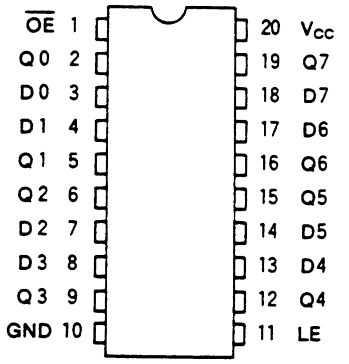

S/L̅ 1
CLOCK 2
E 3
F 4
G 5
H 6
Q̅H 7
GND 8
16 Vcc
15 CLOCK INH
14 D
13 C
12 B
11 A
10 SI
9 QH
CK
S/L̅
CK INH
QH

(TOP VIEW)

INPUTS					INTERNAL OUTPUTS		OUTPUT
SHIFT/ $\overline{\text{LOAD}}$	CLOCK INH	CLOCK	SERIAL IN	PARALLEL A-------H	QA	QB	QH
L	X	X	X	a-------h	a	b	h
H	L	⎍	H	X	H	QAn	QGn
H	L	⎍	L	X	L	QAn	QGn
H	⎍	L	H	X	H	QAn	QGn
H	⎍	L	L	X	L	QAn	QGn
H	X	H	X	X	No change		
H	H	X	X	X	No change		

X : DON'T CARE

MC74HC373F [MOTROLA]
(D-Type Latch With 3-State Output)

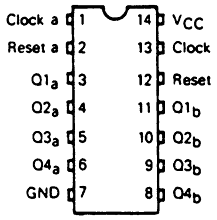


$\overline{OE}$ 1
Q0 2
D0 3
D1 4
Q1 5
Q2 6
D2 7
D3 8
Q3 9
GND 10
20 Vcc
19 Q7
18 D7
17 D6
16 Q6
15 Q5
14 D5
13 D4
12 Q4
11 LE

INPUTS			OUTPUTS
$\overline{OE}$	LE	D	
H	X	X	Z
L	L	X	Q_n
L	H	L	L
L	H	H	H

X : Don't Care
Z : Hi impedance
Qn : Q output level before the LE become "L".

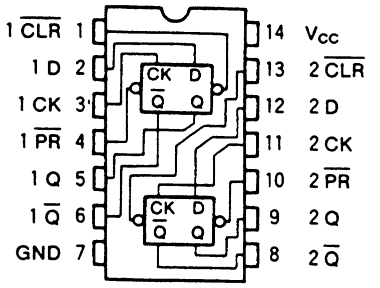
MC74HC393F [MOTROLA]
(Dual 4-stage Binary Ripple Counter)



Clock a 1
Reset a 2
$Q1_a$ 3
$Q2_a$ 4
$Q3_a$ 5
$Q4_a$ 6
GND 7
14 Vcc
13 Clock b
12 Reset b
11 $Q1_b$
10 $Q2_b$
9 $Q3_b$
8 $Q4_b$

Clock	Reset	Outputs
X	H	L
H	L	No Change
L	L	No Change
↑	L	No Change
↓	L	Advance to Next State

MC74HC74AF [MOTROLA]
(Dual D-Type Flip-Flop with Preset and crear)



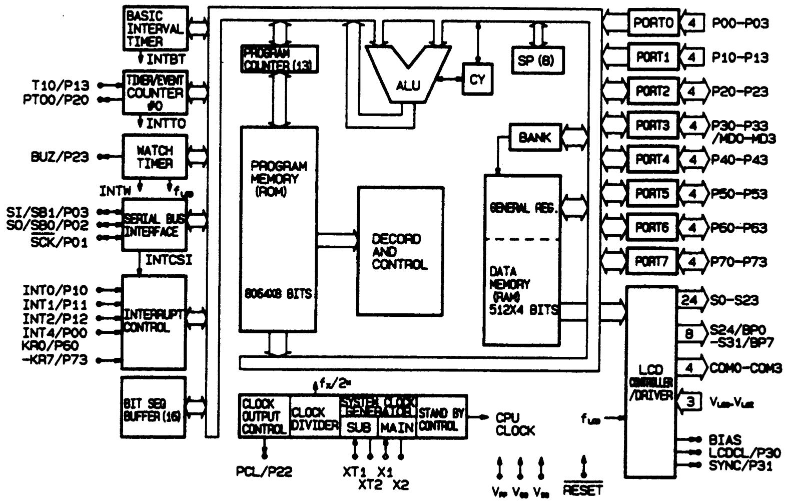
1 $\overline{CLR}$ 1
1 D 2
1 CK 3
1 $\overline{PR}$ 4
1 Q 5
1 $\overline{Q}$ 6
GND 7
14 Vcc
13 2 $\overline{CLR}$
12 2 D
11 2 CK
10 2 $\overline{PR}$
9 2 Q
8 2 $\overline{Q}$
CK D
Q $\overline{Q}$

(TOP VIEW)

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	X	X	L	H	CLEAR
H	L	X	X	H	L	PRESET
L	L	X	X	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	X	↓	Q_n	$\overline{Q}_n$	NO CHANGE

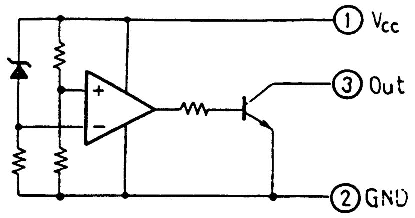
X : Don't care

PGD30561-G01 [JVC]
(One Time Microcomputer)

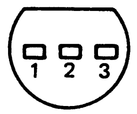


BASIC INTERVAL TIMER
INTBT
T10/P13
PT00/P20
TIMER/EVENT COUNTER #0
INTT0
BUZ/P23
WATCH TIMER
INTW
f_{LCD}
SI/SB1/P03
SO/$\overline{SB0}$/P02
$\overline{SCK}$/P01
SERIAL BUS INTERFACE
INTCSI
INT0/P10
INT1/P11
INT2/P12
INT4/P00
KR0/P60
-KR7/P73
INTERRUPT CONTROL
BIT SEQ BUFFER (16)
PROGRAM COUNTER (13)
ALU
CY
SP (8)
BANK
PROGRAM MEMORY (ROM)
8064X8 BITS
DECORD AND CONTROL
GENERAL REG.
DATA MEMORY (RAM) 512X4 BITS
PORT0 4 P00–P03
PORT1 4 P10–P13
PORT2 4 P20–P23
PORT3 4 P30–P33 /MD0–MD3
PORT4 4 P40–P43
PORT5 4 P50–P53
PORT6 4 P60–P63
PORT7 4 P70–P73
LCD CONTROLLER /DRIVER
24 S0–S23
8 S24/BP0 -S31/BP7
4 COM0–COM3
3 V_{LC0}-V_{LC2}
f_{LCD}
BIAS
LCDCL/P30
SYNC/P31
$f_X/2^N$
CLOCK OUTPUT CONTROL
CLOCK DIVIDER
SYSTEM CLOCK GENERATOR
SUB
MAIN
STAND BY CONTROL
CPU CLOCK
PCL/P22
XT1 X1
XT2 X2
V_{PP} V_{DD} V_{SS}
$\overline{RESET}$

PST529C-2 [MITSUMI]
(System Reset)



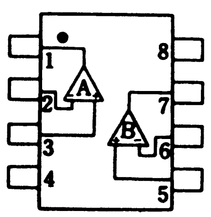
① Vcc
③ Out
② GND



(Bottom View)

RC062M [RAYTHEON]
(J-FET Input Dual OP. Amps)

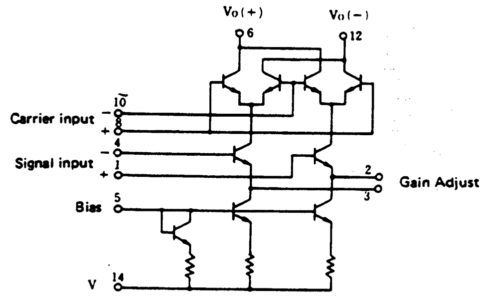
(TOP View)



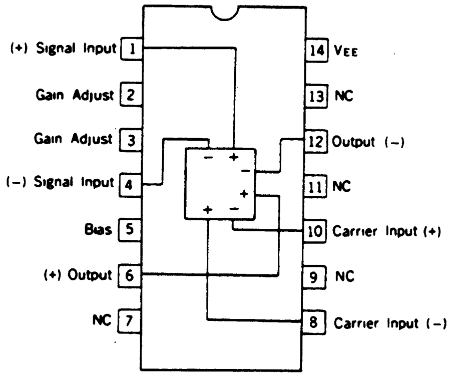
1
2
3
4
8
7
6
5
A
B

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

RC1496M [RAYTHEON]
(Balanced Modulator)



Vo(+)
6
Vo(−)
12
Carrier input
10
8
Signal input
4
1
Bias
5
V
14
2
3
Gain Adjust

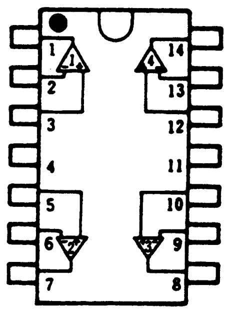


(+) Signal Input 1
Gain Adjust 2
Gain Adjust 3
(−) Signal Input 4
Bias 5
(+) Output 6
NC 7
14 VEE
13 NC
12 Output (−)
11 NC
10 Carrier Input (+)
9 NC
8 Carrier Input (−)

TOP VIEW

RC2902M [RAYTHEON]
(Quad OP. Amplifire)

(TOP VIEW)



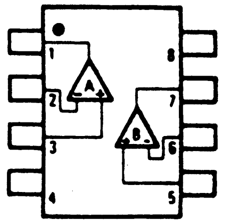
1
2
3
4
5
6
7
14
13
12
11
10
9
8

Pin

1. OUTPUT 1
2. −INPUT 1
3. +INPUT 1
4. V⁺
5. +INPUT 2
6. −INPUT 2
7. OUTPUT 2
8. OUTPUT 3
9. −INPUT 3
10. +INPUT 3
11. GROUND
12. +INPUT 4
13. −INPUT 4
14. OUTPUT 4

RC2904M [RAYTHEON]
(Duad OP. Amplifire)

(Top View)



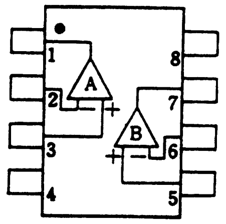
1
2
3
4
8
7
6
5
A
B

Pin

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. GROUND
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

RC2068MD [RAYTHEON]
RC4556M [RAYTHEON]
RC4558M [RAYTHEON]
RC4560MD [RAYTHEON]
(Dual OP. Amplifire)

(Top View)



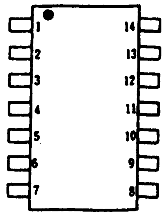
1
2
3
4
8
7
6
5
A
B

Pin

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

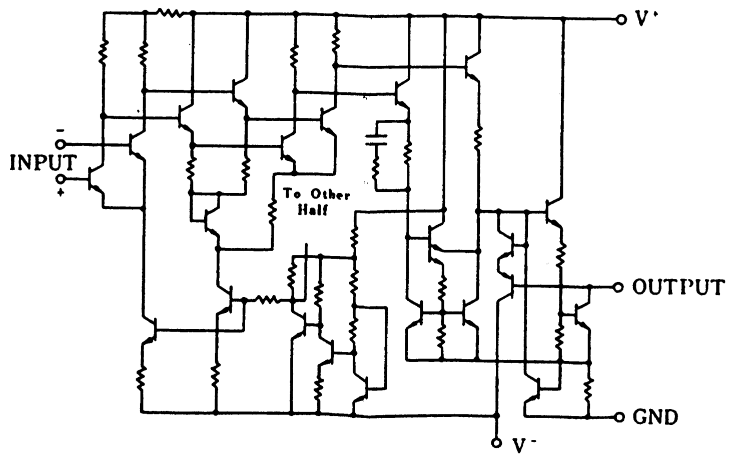
RC319M [RAYTHEON]
(Voltage Comparator)

(Top View)



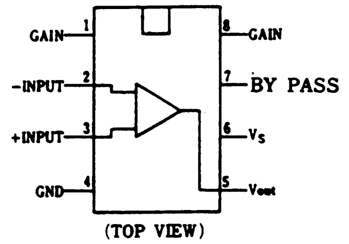
1
2
3
4
5
6
7
14
13
12
11
10
9
8

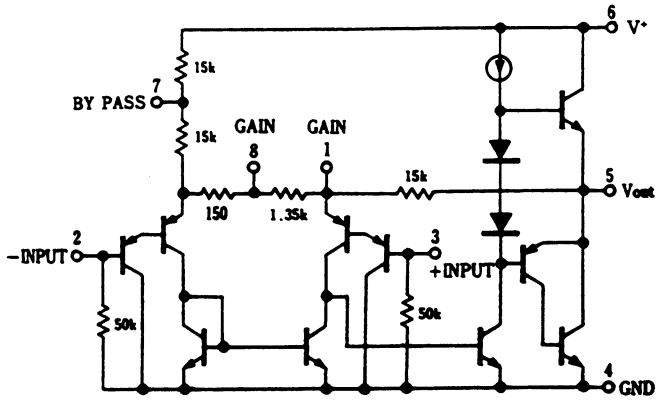
1	NC
2	NC
3 (2)	GND 1
4 (3)	+INPUT
5 (4)	−INPUT
6 (5)	V⁻
7 (6)	OUTPUT 2
8 (7)	GND 2
9 (8)	+INPUT 2
10(9)	−INPUT 2
11(10)	V⁺
12(1)	OUTPUT 1
13	NC
14	NC



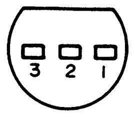
V⁺
INPUT
−
+
To Other Half
OUTPUT
GND
V⁻

RC386M [RAYTHEON]
(Audio Power Amplifire)


GAIN 1
-INPUT 2
+INPUT 3
GND 4
8 GAIN
7 BY PASS
6 Vs
5 Vout
(TOP VIEW)


6 V+
7 BY PASS
15k
15k
GAIN 8
GAIN 1
15k
5 Vout
150
1.35k
2 -INPUT
3 +INPUT
50k
50k
4 GND

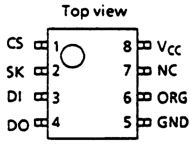
RC78L15UA [RAYTHEON]
RC79L05UA [RAYTHEON]
(Three Terminal Negative Fixed Voltage Regulator)



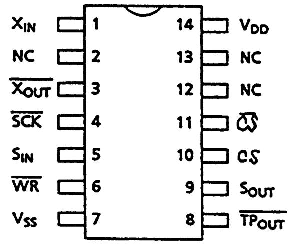
(Bottom View)

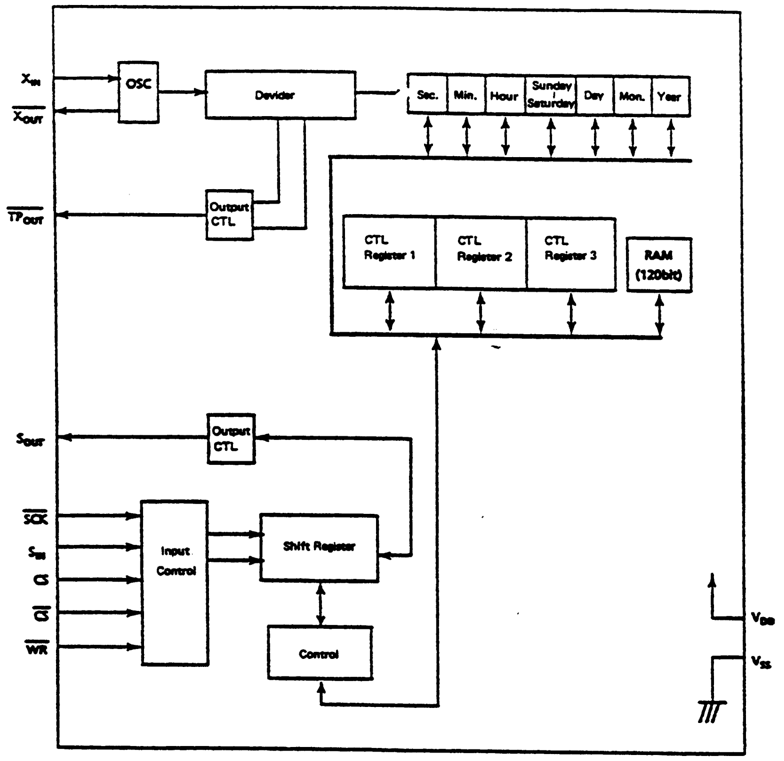
1. INPUT
2. OUTPUT (−5 V)
3. GND

S-2924RF [SEIKO]
(2 K-bit CMOS Serial E^2PROM)

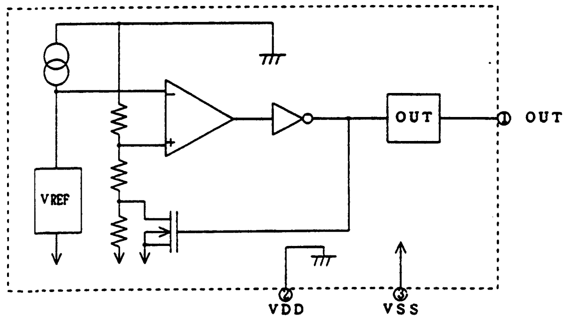

Top view
CS 1
SK 2
DI 3
DO 4
8 Vcc
7 NC
6 ORG
5 GND

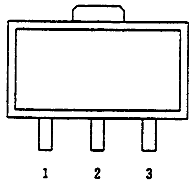
S-3520AF [SEIKO]
(Real Time Clock with 120-bit SRAM)


XIN 1
NC 2
XOUT 3
SCK 4
SIN 5
WR 6
VSS 7
14 VDD
13 NC
12 NC
11 CS
10 CS
9 SOUT
8 TPOUT


XIN
XOUT
OSC
Devider
Sec.
Min.
Hour
Sunday Saturday
Day
Mon.
Year
TPOUT
Output CTL
CTL Register 1
CTL Register 2
CTL Register 3
RAM (120bit)
SOUT
Output CTL
SCK
SIN
CS
CS
WR
Input Control
Shift Register
Control
VDD
VSS

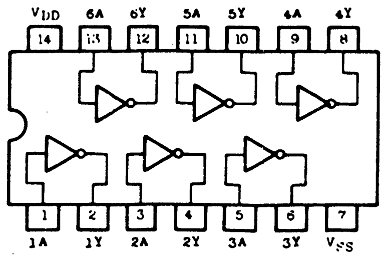
S-8054HNCB [SEIKO]
(Voltage Detecter)


VREF
OUT
OUT
VDD
VSS

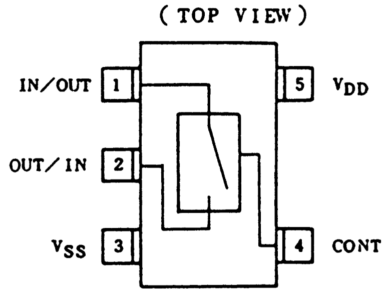


1. OUT
2. VDD
3. VSS

TC40H004F [TOSHIBA]
(Hex Inverter)

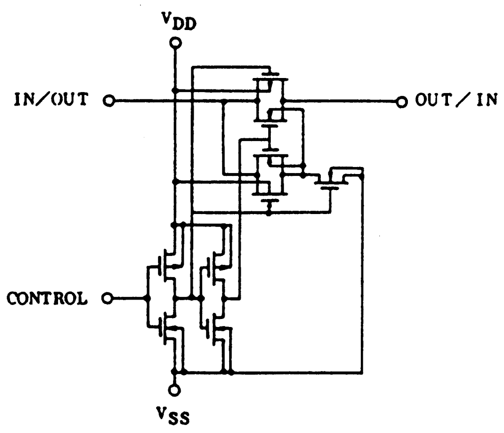

VDD 6A 6Y 5A 5Y 4A 4Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1Y 2A 2Y 3A 3Y VSS

TC4S66F [TOSHIBA]
(Bilateral Switch)

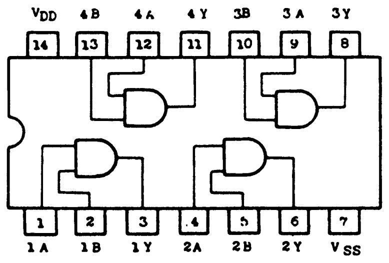

(TOP VIEW)
IN/OUT 1
OUT/IN 2
VSS 3
5 VDD
4 CONT

CONTROL	IMPEDANCE BETWEEN IN/OUT-OUT/IN ※
H	$0.5 \sim 5 \times 10^2$ Ω
L	$> 10^9$ Ω

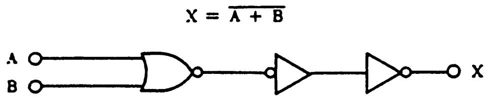
※ See Electrical Characteristics

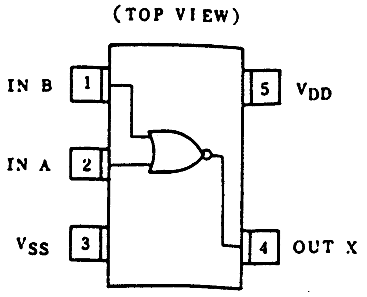

VDD
IN/OUT
OUT/IN
CONTROL
VSS

TC40H008F [TOSHIBA]
(Quad 2-Input AND Gate)

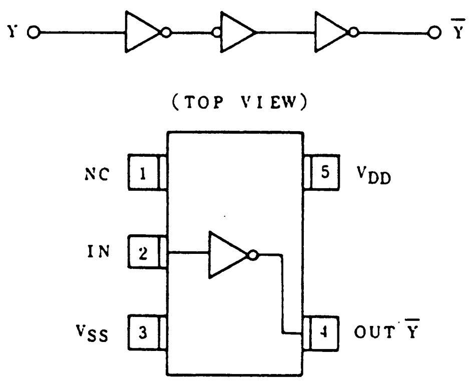

VDD 4B 4A 4Y 3B 3A 3Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1B 1Y 2A 2B 2Y VSS

TC4S01F [TOSHIBA]
(2-input NOR Gate)

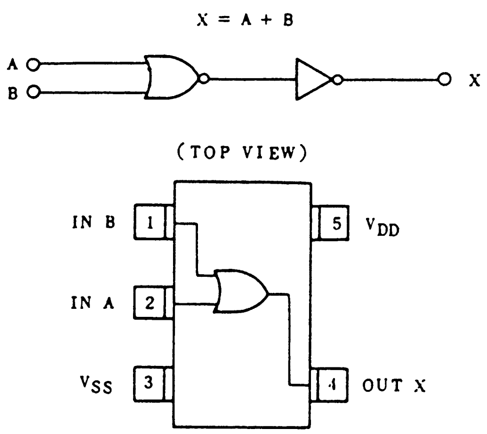

$X = \overline{A + B}$
A
B
X


(TOP VIEW)
IN B 1
IN A 2
VSS 3
5 VDD
4 OUT X

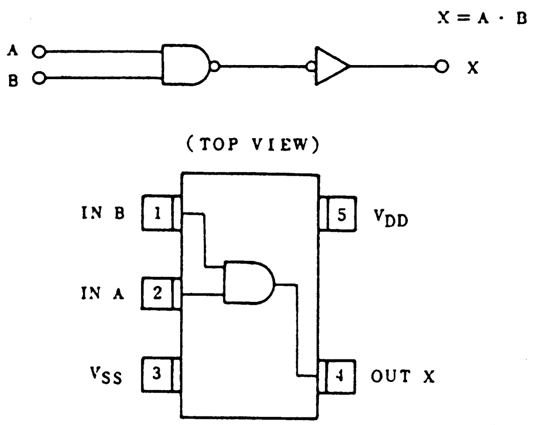
TC4S69F [TOSHIBA]
(Inverter Gate)


Y
Y̅
(TOP VIEW)
NC 1
IN 2
VSS 3
5 VDD
4 OUT Y̅

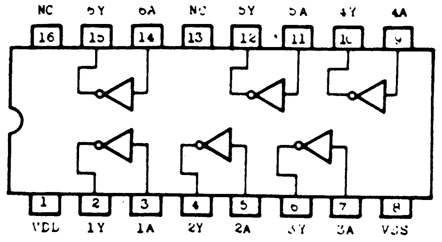
TC4S71F [TOSHIBA]
(2-input OR Gate)


X = A + B
A
B
X
(TOP VIEW)
IN B 1
IN A 2
VSS 3
5 VDD
4 OUT X

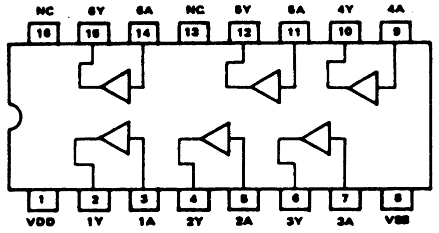
TC4S81F [TOSHIBA]
(2-input AND Gate)


X = A · B
A
B
X
(TOP VIEW)
IN B 1
IN A 2
VSS 3
5 VDD
4 OUT X

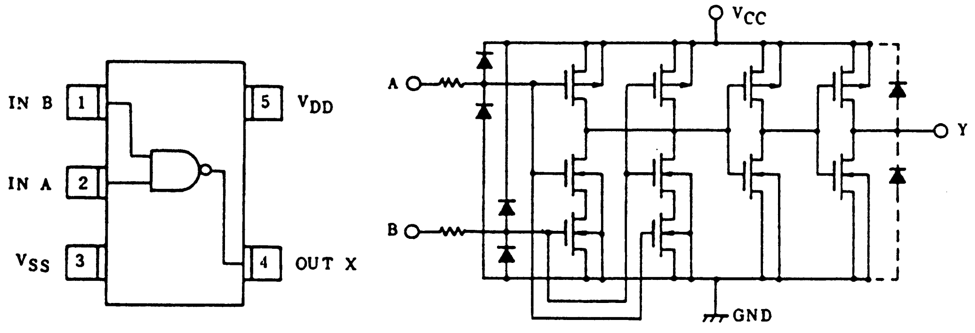
TC50H000F [TOSHIBA]
(Hex Buffer/Converter Inverting type)


NC 16
6Y 15
6A 14
NC 13
5Y 12
5A 11
4Y 10
4A 9
VDD 1
1Y 2
1A 3
2Y 4
2A 5
3Y 6
3A 7
VSS 8

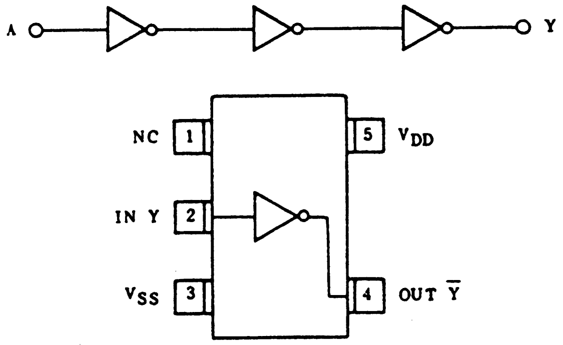
TC50H001F [TOSHIBA]
(Hex Buffer/Converter Non Inverting type)


NC 16
6Y 15
6A 14
NC 13
5Y 12
5A 11
4Y 10
4A 9
VDD 1
1Y 2
1A 3
2Y 4
2A 5
3Y 6
3A 7
VSS 8

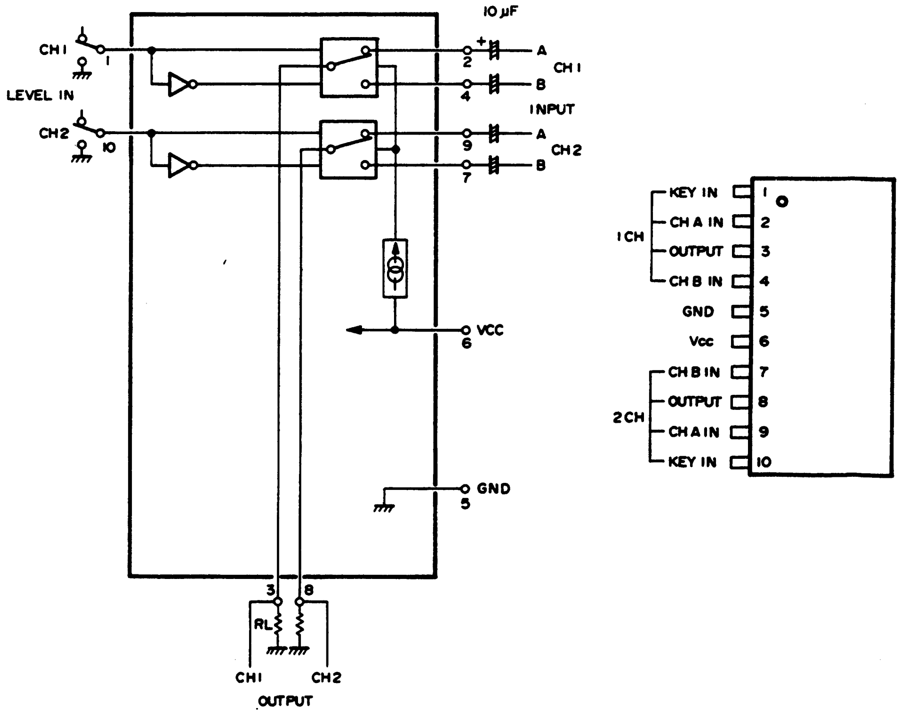
TC7S00F [TOSHIBA]
(2-input NAND Gate)


IN B 1
IN A 2
VSS 3
5 VDD
4 OUT X
VCC
A
B
Y
GND

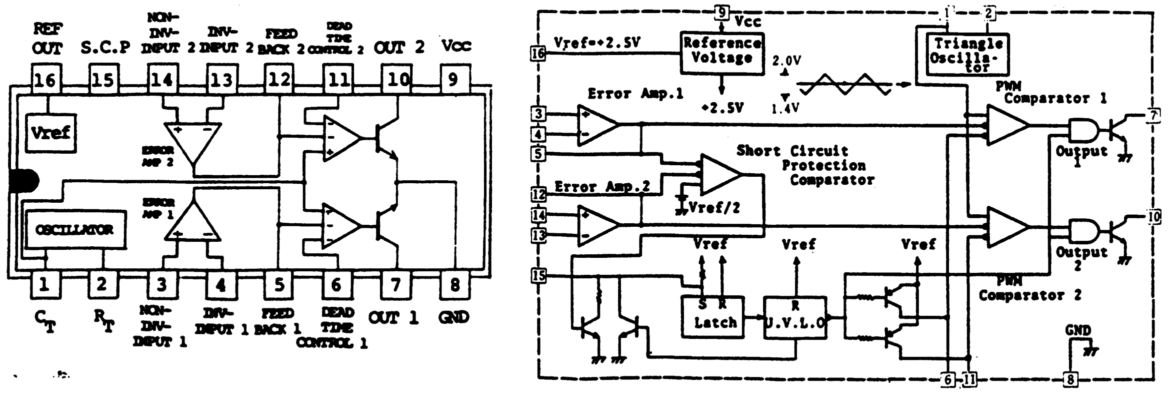
TC7S04F [TOSHIBA]
(Inverter)


A
Y
NC 1
IN Y 2
VSS 3
5 VDD
4 OUT Y̅

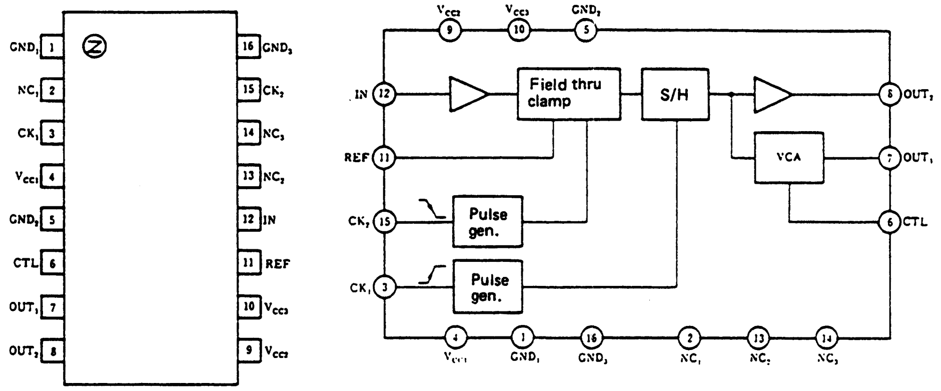
TK15021 [TOKO-DENSHI]
(Analog Switch)


CH1
1
LEVEL IN
CH2
10
10μF
2 A
4 B
CH1
INPUT
9 A
7 B
CH2
VCC
6
GND
5
3
8
RL
CH1
CH2
OUTPUT
1CH
KEY IN 1
CH A IN 2
OUTPUT 3
CH B IN 4
GND 5
Vcc 6
2CH
CH B IN 7
OUTPUT 8
CH A IN 9
KEY IN 10

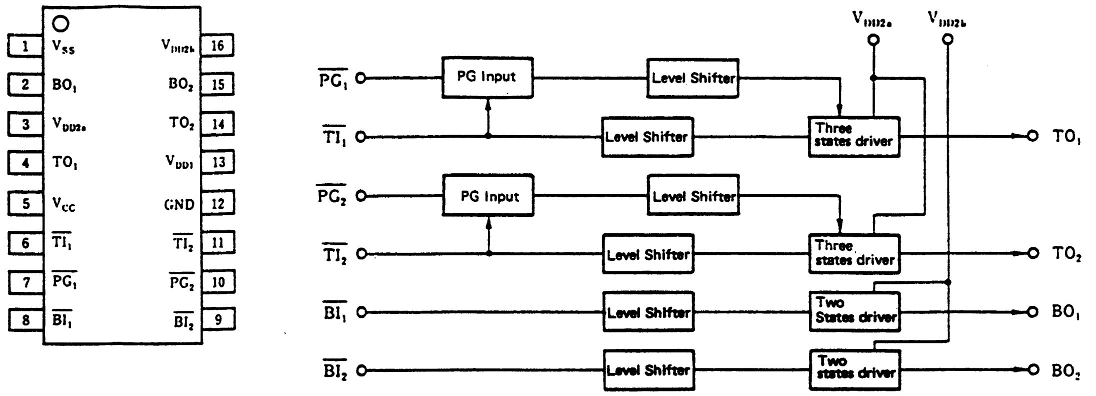
TL1451CNS [TEXAS]
(Dual Switching Regulator Control)


REF OUT 16
S.C.P 15
NON-INV-INPUT 2 14
INV-INPUT 2 13
FEED BACK 2 12
DEAD TIME CONTROL 2 11
OUT 2 10
Vcc 9
CT 1
RT 2
NON-INV-INPUT 1 3
INV-INPUT 1 4
FEED BACK 1 5
DEAD TIME CONTROL 1 6
OUT 1 7
GND 8
Vref
ERROR AMP 2
ERROR AMP 1
OSCILLATOR
9 Vcc
Vref=+2.5V 16
Reference Voltage
+2.5V
2.0V
1.4V
Triangle Oscillator
1
2
Error Amp.1
Error Amp.2
Short Circuit Protection Comparator
Vref/2
PWM Comparator 1
PWM Comparator 2
Output 1
Output 2
7
10
Vref
S R Latch
R U.V.L.O
GND
6
11
8
3
4
5
12
14
13
15

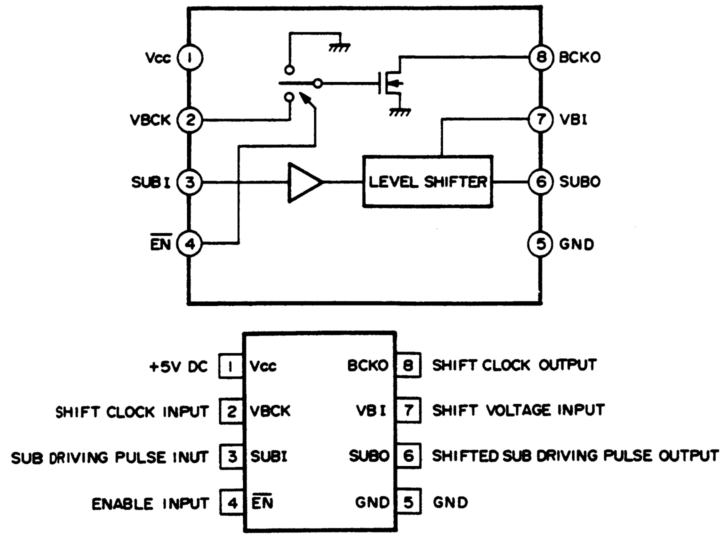
UPC2377G [NEC]
(Sample & Hold)


GND₁ 1
NC₁ 2
CK₁ 3
Vcc₁ 4
GND₂ 5
CTL 6
OUT₁ 7
OUT₂ 8
16 GND₃
15 CK₂
14 NC₃
13 NC₂
12 IN
11 REF
10 Vcc₃
9 Vcc₂
Vcc₂ 9
Vcc₃ 10
GND₂ 5
IN 12
REF 11
CK₂ 15
CK₁ 3
Field thru clamp
S/H
VCA
Pulse gen.
Pulse gen.
8 OUT₂
7 OUT₁
6 CTL
4 Vcc₁
1 GND₁
16 GND₃
2 NC₁
13 NC₂
14 NC₃

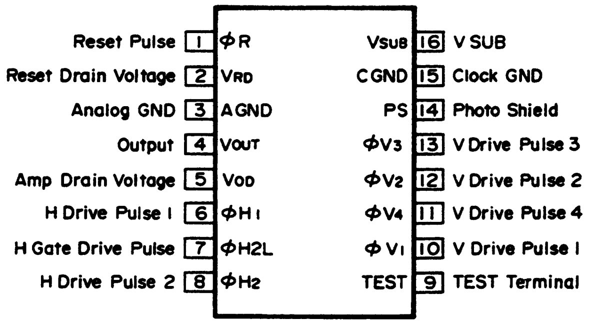
UPD16501 [NEC]
(CCD Driver)


1 Vss
2 BO₁
3 VDD2a
4 TO₁
5 Vcc
6 TI₁
7 PG₁
8 BI₁
16 VDD2b
15 BO₂
14 TO₂
13 VDD1
12 GND
11 TI₂
10 PG₂
9 BI₂
VDD2a
VDD2b
PG₁
TI₁
PG₂
TI₂
BI₁
BI₂
PG Input
PG Input
Level Shifter
Three states driver
Three states driver
Two States driver
Two states driver
TO₁
TO₂
BO₁
BO₂

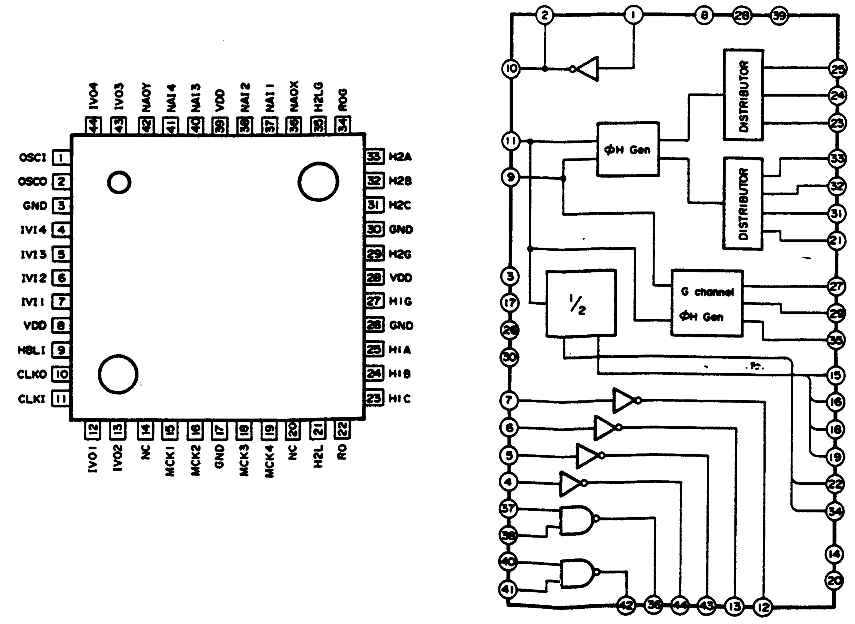
UPD16503GR [NEC]
(Level Shifter)


Vcc 1
VBCK 2
SUBI 3
EN 4
8 BCKO
7 VBI
6 SUBO
5 GND
LEVEL SHIFTER
+5V DC 1 Vcc
SHIFT CLOCK INPUT 2 VBCK
SUB DRIVING PULSE INUT 3 SUBI
ENABLE INPUT 4 EN
BCKO 8 SHIFT CLOCK OUTPUT
VBI 7 SHIFT VOLTAGE INPUT
SUBO 6 SHIFTED SUB DRIVING PULSE OUTPUT
GND 5 GND

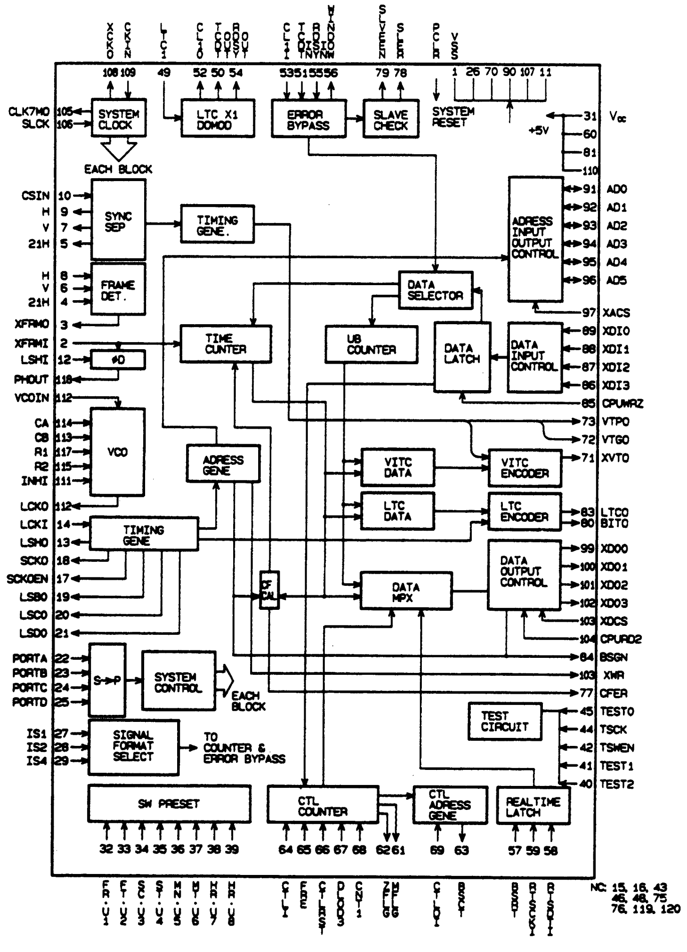
UPD3555D-10 [NEC]
(CCD)


Reset Pulse 1 ΦR
Reset Drain Voltage 2 VRD
Analog GND 3 AGND
Output 4 VOUT
Amp Drain Voltage 5 VOD
H Drive Pulse I 6 ΦH I
H Gate Drive Pulse 7 ΦH2L
H Drive Pulse 2 8 ΦH2
VSUB 16 V SUB
CGND 15 Clock GND
PS 14 Photo Shield
ΦV3 13 V Drive Pulse 3
ΦV2 12 V Drive Pulse 2
ΦV4 11 V Drive Pulse 4
ΦVI 10 V Drive Pulse I
TEST 9 TEST Terminal

UPD9374GB [NEC]
(Pulse Distributor & Driver)


OSCI 1
OSCO 2
GND 3
IVI4 4
IVI3 5
IVI2 6
IVI1 7
VDD 8
HBLI 9
CLKO 10
CLKI 11
IVO1 12
IVO2 13
NC 14
MCK1 15
MCK2 16
GND 17
MCK3 18
MCK4 19
NC 20
H2L 21
RO 22
23 H1C
24 H1B
25 H1A
26 GND
27 H1G
28 VDD
29 H2G
30 GND
31 H2C
32 H2B
33 H2A
34 ROG
35 H2LG
36 NAOX
37 NAI1
38 NAI2
39 VDD
40 NAI3
41 NAI4
42 NAOY
43 IVO3
44 IVO4
ΦH Gen
DISTRIBUTOR
DISTRIBUTOR
1/2
G channel ΦH Gen

VC2067A [JVC]
(Time Code Controller)


XCKO 108
CKIN 109
LCI 49
CLIO 52
TCDT 50
RDUSY 54
CLII 53
TCDIN 51
RDSIY 55
WINDOW 56
SLVEEN 79
SLER 78
PCLR
VSS 1 26 70 90 107 11
SYSTEM CLOCK
LTC X1 DOMOD
ERROR BYPASS
SLAVE CHECK
SYSTEM RESET
+5V
31 Vcc
60
81
110
CLK7MO 105
SLCK 106
EACH BLOCK
CSIN 10
H 9
V 7
21H 5
SYNC SEP
TIMING GENE.
H 8
V 6
21H 4
FRAME DET.
XFRMO 3
XFRMI 2
LSHI 12
ΦD
PHOUT 118
VCOIN 112
CA 114
CB 113
R1 117
R2 115
INHI 111
VCO
LCKO 112
LCKI 14
LSHO 13
SCKO 18
SCKOEN 17
LSBO 19
LSCO 20
LSDO 21
TIMING GENE
ADRESS GENE
TIME CUNTER
UB COUNTER
DATA SELECTOR
DATA LATCH
DATA INPUT CONTROL
ADRESS INPUT OUTPUT CONTROL
91 AD0
92 AD1
93 AD2
94 AD3
95 AD4
96 AD5
97 XACS
89 XDI0
88 XDI1
87 XDI2
86 XDI3
85 CPUWRZ
73 VTPO
72 VTGO
71 XVTO
VITC DATA
VITC ENCODER
LTC DATA
LTC ENCODER
83 LTCO
80 BITO
DATA OUTPUT CONTROL
99 XDO0
100 XDO1
101 XDO2
102 XDO3
103 XDCS
104 CPURD2
84 BSGN
103 XWR
77 CFER
CF CAL
DATA MPX
PORTA 22
PORTB 23
PORTC 24
PORTD 25
S→P
SYSTEM CONTROL
EACH BLOCK
IS1 27
IS2 28
IS4 29
SIGNAL FORMAT SELECT
TO COUNTER & ERROR BYPASS
TEST CIRCUIT
45 TESTO
44 TSCK
42 TSWEN
41 TEST1
40 TEST2
SW PRESET
CTL COUNTER
CTL ADRESS GENE
REALTIME LATCH
32 33 34 35 36 37 38 39
64 65 66 67 68 62 61
69 63
57 59 58
FR·U1
FT·U2
SC·U3
ST·U4
MN·U5
MT·U6
HR·U7
HR·U8
CTLI
FRE
CTLRST
DLOD3
CNT1
ZFLG
MFLG
CTLOI
BSCT
BSOT
BTSCKI
BTSDTI
NC: 15, 16, 43
46, 48, 75
76, 119, 120

SECTION 7
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers. For maximum reliability and performance, all other replacement parts should be identical to those specified.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS – All resistance values are in ohms (Ω).

K : 1 000
M : 1 000 000
CR : Carbon Resistor
VR : Variable Resistor (Potentiometer)
MFR : Metal Film Resistor
Chip R : Chip Resistor

CAPACITORS – All capacitance values are in μF, unless otherwise indicated.

P : μμF
C Cap : Ceramic Capacitor
E Cap : Electrolytic Capacitor
FM Cap : Film Mica Capacitor
MY Cap : Mylar Capacitor
NP Cap : Non-polar Capacitor
T Cap : Tantalum Capacitor
TR Cap : Trimmer Capacitor
MP Cap : Metalized Paper Capacitor

7.1 ISB board assembly 5 1

5 1 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC2	UPC2377GS	I.C.(M)	NEC	
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA	
R2	NRSA02J-473	MGR	47K	1/10W
R3	NRSA02J-473	MGR	47K	1/10W
R4	NRSA02J-102	MGR	1.0K	1/10W
R5	NRSA02J-332	MGR	3.3K	1/10W
R6	NRSA02J-220	MGR	22	1/10W
R7	NRSA02J-473	MGR	47K	1/10W
R8	NRSA02J-473	MGR	47K	1/10W
R9	NRSA02J-332	MGR	3.3K	1/10W
R10	NRSA02J-332	MGR	3.3K	1/10W
R11	NRSA02J-474	MGR	470K	1/10W
R14	NRSA02J-222	MGR	2.2K	1/10W
R15	NRSA02J-0R0	MGR	0	1/10W
R16	NRSA02J-391	MGR	390	1/10W
R17	NRSA02J-391	MGR	390	1/10W
R18	NRSA02J-391	MGR	390	1/10W
C1	NCF21EZ-104	C CAP	0.10	25V
C2	NEF10JM-226	T CAP	22	6.3V
C5	NCF21EZ-104	C CAP	0.10	25V
C6	NEF11EM-475	T CAP	4.7	25V
C7	NEF11CM-106	T CAP	10	16V
C8	NCF21EZ-104	C CAP	0.10	25V
C9	NEF11EM-475	T CAP	4.7	25V
C10	NCF21EZ-104	C CAP	0.10	25V
C11	NCF21HZ-103	C CAP	0.010	50V
C13	NCF21EZ-104	C CAP	0.10	25V
C14	NEF11CM-106	T CAP	10	16V
CN1	SCV1770-003	CONNECTOR	3 pin	
CN4	SSV1321-014	CONNECTOR	14 pin	

7.2 ISG board assembly 5 2

5 2 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC2	UPC2377GS	I.C.(M)	NEC	
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA	
Q2	3SK157	F.E.T.	NEC	
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA	
R2	NRSA02J-473	MGR	47K	1/10W
R3	NRSA02J-473	MGR	47K	1/10W
R4	NRSA02J-102	MGR	1.0K	1/10W
R5	NRSA02J-332	MGR	3.3K	1/10W
R6	NRSA02J-220	MGR	22	1/10W
R7	NRSA02J-473	MGR	47K	1/10W
R8	NRSA02J-473	MGR	47K	1/10W
R9	NRSA02J-332	MGR	3.3K	1/10W
R10	NRSA02J-332	MGR	3.3K	1/10W
R11	NRSA02J-474	MGR	470K	1/10W
R12	NRSA02J-101	MGR	100	1/10W
R13	NRSA02J-152	MGR	1.5K	1/10W
R14	NRSA02J-222	MGR	2.2K	1/10W
R15	NRSA02J-0R0	MGR	0	1/10W
R16	NRSA02J-391	MGR	390	1/10W
R17	NRSA02J-391	MGR	390	1/10W
R18	NRSA02J-391	MGR	390	1/10W
C1	NCF21EZ-104	C CAP	0.10	25V
C2	NEF10JM-226	T CAP	22	6.3V
C5	NCF21EZ-104	C CAP	0.10	25V
C6	NEF11EM-475	T CAP	4.7	25V
C7	NEF11CM-106	T CAP	10	16V
C8	NCF21EZ-104	C CAP	0.10	25V
C9	NEF11EM-475	T CAP	4.7	25V
C10	NCF21EZ-104	C CAP	0.10	25V
C11	NCF21HZ-103	C CAP	0.010	50V
C12	NCT03CH-330	C CAP	33P	50V
C13	NCF21EZ-104	C CAP	0.10	25V
C14	NEF11CM-106	T CAP	10	16V
CN2	SCV1770-003	CONNECTOR	3 pin	
CN5	SSV1321-014	CONNECTOR	14 pin	

7.3 ISR board assembly 53

53□□□□□□

Symbol No.	Part No.	Part Name	Description
IC2	UPC2377GS	I.C.(M)	NEC
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
R2	NRSA02J-473	MGR	47K 1/10W
R3	NRSA02J-473	MGR	47K 1/10W
R4	NRSA02J-102	MGR	1.0K 1/10W
R5	NRSA02J-332	MGR	3.3K 1/10W
R6	NRSA02J-220	MGR	22 1/10W
R7	NRSA02J-473	MGR	47K 1/10W
R8	NRSA02J-473	MGR	47K 1/10W
R9	NRSA02J-332	MGR	3.3K 1/10W
R10	NRSA02J-332	MGR	3.3K 1/10W
R11	NRSA02J-474	MGR	470K 1/10W
R14	NRSA02J-222	MGR	2.2K 1/10W
R15	NRSA02J-0R0	MGR	0 1/10W
R16	NRSA02J-391	MGR	390 1/10W
R17	NRSA02J-391	MGR	390 1/10W
R18	NRSA02J-391	MGR	390 1/10W
C1	NCF21EZ-104	C CAP	0.10 25V
C2	NEF10JM-226	T CAP	22 6.3V
C5	NCF21EZ-104	C CAP	0.10 25V
C6	NEF11EM-475	T CAP	4.7 25V
C7	NEF11CM-106	T CAP	10 16V
C8	NCF21EZ-104	C CAP	0.10 25V
C9	NEF11EM-475	T CAP	4.7 25V
C10	NCF21EZ-104	C CAP	0.10 25V
C11	NCF21HZ-103	C CAP	0.010 50V
C13	NCF21EZ-104	C CAP	0.10 25V
C14	NEF11CM-106	T CAP	10 16V
CN3	SCV1770-003	CONNECTOR	3 pin
CN6	SSV1321-014	CONNECTOR	14 pin

7.4 DR1 board assembly 54

54□□□□□□

Symbol No.	Part No.	Part Name	Description
IC1	RC78L15UA	I.C.(M)	RAYTHEON
IC2	UPD16503GR	I.C.(M)	NEC
IC3	UPD16503GR	I.C.(M)	NEC
IC4	UPD16503GR	I.C.(M)	NEC
IC5	MC74HC04AF	I.C.(M)	MOTOROLA
IC6	TC40H008F	I.C.(M)	TOSHIBA
Q1	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q2	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q3	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q4	2SD874(QR)	TRANSISTOR	MATSUSHITA
Q5	2SD874(QR)	TRANSISTOR	MATSUSHITA
Q6	2SB766(QR)	TRANSISTOR	MATSUSHITA
Q7	DTC124EK	TRANSISTOR	ROHM
Q8	DTC124EK	TRANSISTOR	ROHM
D1	MA152A	DIODE	MATSUSHITA
D2	MA152A	DIODE	MATSUSHITA
D3	MA152A	DIODE	MATSUSHITA
D4	MA153	DIODE	MATSUSHITA
D5	RD43MB-T1	ZENER DIODE	HITACHI
D6	RD43MB-T1	ZENER DIODE	HITACHI
D7	MA153	DIODE	MATSUSHITA
D8	RD43MB-T1	ZENER DIODE	HITACHI
D9	RD43MB-T1	ZENER DIODE	HITACHI
D10	MA153	DIODE	MATSUSHITA
D11	RD43MB-T1	ZENER DIODE	HITACHI
D12	RD43MB-T1	ZENER DIODE	HITACHI
D13	RD16MB1	ZENER DIODE	NEC
D14	MA152WK	DIODE	MATSUSHITA
R2	NRSA02J-822	MGR	8.2K 1/10W
R3	NRSA02J-473	MGR	47K 1/10W
R5	NRSA02J-822	MGR	8.2K 1/10W
R6	NRSA02J-473	MGR	47K 1/10W
R8	NRSA02J-822	MGR	8.2K 1/10W
R9	NRSA02J-473	MGR	47K 1/10W
R10	NRSA02J-102	MGR	1.0K 1/10W
R12	NRSA02J-104	MGR	100K 1/10W
R13	NRSA02J-392	MGR	3.9K 1/10W
R14	NRSA02J-392	MGR	3.9K 1/10W
R15	NRSA02J-101	MGR	100 1/10W
R16	NRSA02J-272	MGR	2.7K 1/10W
R17	NRSA02J-183	MGR	18K 1/10W
R18	NRSA02J-181	MGR	180 1/10W
R19	NRSA02J-222	MGR	2.2K 1/10W
R20	NRSA02J-181	MGR	180 1/10W
R21	NRSA02J-222	MGR	2.2K 1/10W
R22	NRSA02J-181	MGR	180 1/10W
R23	NRSA02J-222	MGR	2.2K 1/10W
R25	NRSA02J-331	MGR	330 1/10W
R27	NRSA02J-223	MGR	22K 1/10W
R28	NRSA02J-105	MGR	1.0M 1/10W
R29	NRSA02J-103	MGR	10K 1/10W
R30	NRSA02J-473	MGR	47K 1/10W
R31	NRSA02J-473	MGR	47K 1/10W
R32	NRSA02J-473	MGR	47K 1/10W
R33	NRSA02J-100	MGR	10 1/10W
R34	NRSA02J-472	MGR	4.7K 1/10W

(DR1)

Symbol No.	Part No.	Part Name	Description
R35	NRSA02J-472	MGR	4.7K 1/10W
R36	NRSA02J-472	MGR	4.7K 1/10W
R37	NRSA02J-223	MGR	22K 1/10W
R38	NRSA02J-223	MGR	22K 1/10W
R39	NRSA02J-223	MGR	22K 1/10W
R40	NRSA02J-104	MGR	100K 1/10W
VR1	NVP1500-203	V.RESISTOR	20K B VSUB
VR2	NVP1500-203	V.RESISTOR	20K G VSUB
VR3	NVP1500-203	V.RESISTOR	20K R VSUB
VR4	NVP1500-103	V.RESISTOR	10K VH
VR5	NVP1500-102	V.RESISTOR	1K HP SHP TIM.
VR6	NVP1500-102	V.RESISTOR	1K SAMPLE TIM.
C1	NEA11EM-106	E CAP	10 25V
C2	NEA11CM-226	E CAP	22 16V
C3	NCF21EZ-104	C CAP	0.10 25V
C5	NCF21EZ-104	C CAP	0.10 25V
C7	NCF21EZ-104	C CAP	0.10 25V
C9	NCF21EZ-104	C CAP	0.10 25V
C10	NCF21EZ-104	C CAP	0.10 25V
C11	NEA10JM-107	E CAP	100 6.3V
C12	NEA10GM-476	E CAP	47 4V
C13	NEA10JM-107	E CAP	100 6.3V
C14	NEA11EM-106	E CAP	10 25V
C15	NEA11EM-106	E CAP	10 25V
C16	NCF21EZ-104	C CAP	0.10 25V
C17	NCF21EZ-104	C CAP	0.10 25V
C18	NCF21HZ-473	C CAP	0.047 50V
C19	NEA11HM-105	E CAP	1.0 50V
C20	NEA11CM-476	E CAP	47 16V
C21	NCF21EZ-104	C CAP	0.10 25V
C22	NCF21EZ-104	C CAP	0.10 25V
C23	NCF21HZ-473	C CAP	0.047 50V
C24	NEA11HM-105	E CAP	1.0 50V
C25	NEA11CM-476	E CAP	47 16V
C26	NCF21EZ-104	C CAP	0.10 25V
C27	NCF21EZ-104	C CAP	0.10 25V
C28	NCF21HZ-473	C CAP	0.047 50V
C29	NEA11HM-105	E CAP	1.0 50V
C30	NEA11CM-476	E CAP	47 16V
C31	NCTO3CH-100	C CAP	10P 50V
C32	NCTO3CH-680	C CAP	68P 50V
C33	NCTO3CH-270	C CAP	27P 50V
C34	NCF21EZ-104	C CAP	0.10 25V
C35	NCF21EZ-104	C CAP	0.10 25V
C36	NCTO3CH-101	C CAP	100P 50V
L2	SSV1493-102	COIL	
L3	SSV1493-102	COIL	
L4	SSV1493-102	COIL	
LC1	SCV1804-222	EMI FILTER	
DL1	SCV1807-040	DELAY LINE	

Symbol No.	Part No.	Part Name	Description
CN7	SCV1814-022	CONNECTOR	22 pin
CN8	SCV1770-014	CONNECTOR	14 pin
CN27	SCV1770-003	CONNECTOR	3 pin

7.5 DR2 board assembly 5 5

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Symbol No.	Part No.	Part Name	Description
IC1	UPD9422GB	I.C.(M)	NEC
IC2	UPD9328AGK-BE9	I.C.(M)	NEC
IC3	UPD16501GS	I.C.(M)	NEC
IC4	UPD16501GS	I.C.(M)	NEC
IC5	UPD16501GS	I.C.(M)	NEC
IC6	TC7SU04F	I.C.(M)	TOSHIBA
D1	FC-52M	VARI.CAP.DIODE	FUJITSU
D2	MA152A	DIODE	MATSUSHITA
R1	NRSA02J-472	MGR	4.7K 1/10W
R2	NRSA02J-472	MGR	4.7K 1/10W
R3	NRSA02J-221	MGR	220 1/10W
R4	NRSA02J-104	MGR	100K 1/10W
R5	NRSA02J-105	MGR	1.0M 1/10W
R6	NRSA02J-471	MGR	470 1/10W
R7	NRSA02J-103	MGR	10K 1/10W
R9	NRSA02J-472	MGR	4.7K 1/10W
R10	NRSA02J-472	MGR	4.7K 1/10W
R11	NRSA02J-0R0	MGR	0 1/10W
R14	NRSA02J-4R7	MGR	4.7 1/10W
R15	NRSA02J-4R7	MGR	4.7 1/10W
R16	NRSA02J-4R7	MGR	4.7 1/10W
R17	NRSA02J-4R7	MGR	4.7 1/10W
R18	NRSA02J-4R7	MGR	4.7 1/10W
R19	NRSA02J-4R7	MGR	4.7 1/10W
R20	NRSA02J-220	MGR	22 1/10W
C1	NEA10JM-107	E CAP	100 6.3V
C2	QETA0JM-337	E CAP	330 6.3V
C3	NCF21EZ-104	C CAP	0.10 25V
C4	NEF11CM-106	T CAP	10 16V
C5	NEF11AM-225	T CAP	2.2 10V
C6	NCT03CH-221	C CAP	220P 50V
C7	NCT03CH-220	C CAP	22P 50V
C8	NCT03CH-560	C CAP	56P 50V
C9	NEA10JM-107	E CAP	100 6.3V
C10	NCF21EZ-104	C CAP	0.10 25V
C11	NEF11CM-106	T CAP	10 16V

Symbol No.	Part No.	Part Name	Description
C12	NEF11CM-106	T CAP	10 16V
C13	NEA11EM-106	E CAP	10 25V
C14	NEA10GM-227	E CAP	220 4V
C15	NEA11EM-106	E CAP	10 25V
C16	NCF21EZ-104	C CAP	0.10 25V
C17	NCF21EZ-104	C CAP	0.10 25V
C18	NCF21EZ-104	C CAP	0.10 25V
C19	NEA11CM-476	E.CAP	47 16V
C20	NEA10GM-227	E CAP	220 4V
C21	NCF21EZ-104	C CAP	0.10 25V
L1	SSV1330-150	COIL	15μ
L2	SSV1330-150	COIL	15μ
X1	SCV1979-002	CRYSTAL	25.75MHz
CN4	SSV1321-014	CONNECTOR	14 pin
CN5	SSV1321-014	CONNECTOR	14 pin
CN6	SSV1321-014	CONNECTOR	14 pin
CN7	SCV1815-022	CONNECTOR	22 pin

7.6 PR1 board assembly 5 6

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Symbol No.	Part No.	Part Name	Description
IC1	JCS0003	I.C.(M)	JVC
IC2	JCS0003	I.C.(M)	JVC
IC3	JCS0003	I.C.(M)	JVC
IC4	RC4558M	I.C.(M)	RAYTHEON
IC5	RC4558M	I.C.(M)	RAYTHEON
IC6	RC4558M	I.C.(M)	RAYTHEON
IC7	RC4558MB	I.C.(M)	RAYTHEON
IC9	RC062M	I.C.(M)	JRC
IC10	LM2904M	I.C.(M)	TEXAS
IC11	RC4558MB	I.C.(M)	RAYTHEON
IC12	LM2904M	I.C.(M)	TEXAS
IC13	TC4S69F	I.C.(M)	TOSHIBA
IC14	LM2902M	I.C.(M)	TEXAS
IC15	LM2904M	I.C.(M)	TEXAS
IC16	LM2902M	I.C.(M)	TEXAS
IC17	MC14053BF	I.C.(M)	MOTOROLA
IC18	LM2902M	I.C.(M)	TEXAS
IC20	MB88342PF	I.C.(M)	FUJITSU
IC21	MB88342PF	I.C.(M)	FUJITSU
IC22	MC14094BF	I.C.(M)	MOTOROLA
IC23	LM2902M	I.C.(M)	TEXAS
IC24	LM2904M	I.C.(M)	TEXAS
Q1	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q2	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q4	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q5	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q6	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q7	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q8	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q9	2SK198(Q.R)	FET	MATSUSHITA
Q10	2SK198(Q.R)	FET	MATSUSHITA
Q11	2SK198(Q.R)	FET	MATSUSHITA
Q12	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q13	2SK198(Q.R)	FET	MATSUSHITA
Q15	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q16	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q17	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q18	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q19	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q20	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q21	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q22	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q23	2SK198(Q.R)	FET	MATSUSHITA
Q24	2SK198(Q.R)	FET	MATSUSHITA
Q25	2SK198(Q.R)	FET	MATSUSHITA
Q26	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q27	2SK198(Q.R)	FET	MATSUSHITA
Q29	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q30	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q31	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q32	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q33	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q34	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q35	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q36	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q37	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q38	2SK198(Q.R)	FET	MATSUSHITA

(PR1)

Symbol No.	Part No.	Part Name	Description
Q39	2SK198(Q.R)	FET	MATSUSHITA
Q40	2SK198(Q.R)	FET	MATSUSHITA
Q41	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q42	2SK198(Q.R)	FET	MATSUSHITA
Q44	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q45	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q46	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q47	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q50	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q51	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q52	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q53	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q54	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q55	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q56	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q57	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q58	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q59	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q60	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q61	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q62	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q63	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q64	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q65	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q66	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q67	DTC124EK	TRANSISTOR	ROHM
Q68	DTC124EK	TRANSISTOR	ROHM
Q69	DTC124EK	TRANSISTOR	ROHM
Q70	DTC124EK	TRANSISTOR	ROHM
Q71	DTA124EK	TRANSISTOR	ROHM
Q72	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q73	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q77	2SA1179(M6)	TRANSISTOR	SANYO
D1	MA152A	DIODE	MATSUSHITA
D2	MA152A	DIODE	MATSUSHITA
D3	MA152A	DIODE	MATSUSHITA
D4	MA152A	DIODE	MATSUSHITA
R1	NRSA02J-152	MGR	1.5K 1/10W
R2	NRSA02J-472	MGR	4.7K 1/10W
R3	NRSA02J-102	MGR	1.0K 1/10W
R4	NRSA02J-222	MGR	2.2K 1/10W
R5	NRSA02J-102	MGR	1.0K 1/10W
R6	NRSA02J-102	MGR	1.0K 1/10W
R7	NRSA02J-222	MGR	2.2K 1/10W
R8	NRSA02J-471	MGR	470 1/10W
R9	NRSA02J-473	MGR	47K 1/10W
R10	NRSA02J-152	MGR	1.5K 1/10W
R11	NRSA02J-222	MGR	2.2K 1/10W
R12	NRSA02J-103	MGR	10K 1/10W
R13	NRSA02J-102	MGR	1.0K 1/10W
R14	NRSA02J-102	MGR	1.0K 1/10W
R15	NRSA02J-102	MGR	1.0K 1/10W
R16	NRSA02J-222	MGR	2.2K 1/10W
R17	NRSA02J-333	MGR	33K 1/10W
R18	NRSA02J-105	MGR	1.0M 1/10W
R19	NRSA02J-682	MGR	6.8K 1/10W
R20	NRSA02J-333	MGR	33K 1/10W
R21	NRSA02J-102	MGR	1.0K 1/10W
R22	NRSA02J-101	MGR	100 1/10W
R23	NRSA02J-223	MGR	22K 1/10W
R24	NRSA02J-152	MGR	1.5K 1/10W
R25	NRSA02J-104	MGR	100K 1/10W
R26	NRSA02J-103	MGR	10K 1/10W
R27	NRSA02J-104	MGR	100K 1/10W
R28	NRSA02J-153	MGR	15K 1/10W
R29	NRSA02J-682	MGR	6.8K 1/10W
R30	NRSA02J-471	MGR	470 1/10W
R32	NRSA02J-472	MGR	4.7K 1/10W
R33	NRSA02J-103	MGR	10K 1/10W
R34	NRSA02J-101	MGR	100 1/10W
R35	NRSA02J-272	MGR	2.7K 1/10W
R36	NRSA02J-102	MGR	1.0K 1/10W
R37	NRSA02J-472	MGR	4.7K 1/10W
R38	NRSA02J-222	MGR	2.2K 1/10W
R39	NRSA02J-102	MGR	1.0K 1/10W
R40	NRSA02J-102	MGR	1.0K 1/10W
R41	NRSA02J-222	MGR	2.2K 1/10W
R42	NRSA02J-471	MGR	470 1/10W
R43	NRSA02J-473	MGR	47K 1/10W
R44	NRSA02J-152	MGR	1.5K 1/10W
R45	NRSA02J-222	MGR	2.2K 1/10W
R46	NRSA02J-103	MGR	10K 1/10W
R47	NRSA02J-102	MGR	1.0K 1/10W
R48	NRSA02J-102	MGR	1.0K 1/10W
R49	NRSA02J-102	MGR	1.0K 1/10W
R50	NRSA02J-222	MGR	2.2K 1/10W
R51	NRSA02J-333	MGR	33K 1/10W
R52	NRSA02J-105	MGR	1.0M 1/10W
R53	NRSA02J-682	MGR	6.8K 1/10W
R54	NRSA02J-333	MGR	33K 1/10W
R55	NRSA02J-102	MGR	1.0K 1/10W
R56	NRSA02J-101	MGR	100 1/10W
R57	NRSA02J-223	MGR	22K 1/10W
R58	NRSA02J-152	MGR	1.5K 1/10W
R59	NRSA02J-104	MGR	100K 1/10W
R60	NRSA02J-103	MGR	10K 1/10W
R61	NRSA02J-104	MGR	100K 1/10W
R62	NRSA02J-153	MGR	15K 1/10W
R66	NRSA02J-472	MGR	4.7K 1/10W
R67	NRSA02J-221	MGR	220 1/10W
R68	NRSA02J-152	MGR	1.5K 1/10W
R69	NRSA02J-272	MGR	2.7K 1/10W
R70	NRSA02J-102	MGR	1.0K 1/10W
R71	NRSA02J-472	MGR	4.7K 1/10W
R72	NRSA02J-222	MGR	2.2K 1/10W
R73	NRSA02J-102	MGR	1.0K 1/10W
R74	NRSA02J-102	MGR	1.0K 1/10W
R75	NRSA02J-222	MGR	2.2K 1/10W
R76	NRSA02J-471	MGR	470 1/10W
R77	NRSA02J-473	MGR	47K 1/10W
R78	NRSA02J-152	MGR	1.5K 1/10W
R79	NRSA02J-222	MGR	2.2K 1/10W
R80	NRSA02J-103	MGR	10K 1/10W
R81	NRSA02J-102	MGR	1.0K 1/10W
R82	NRSA02J-182	MGR	1.8K 1/10W
R83	NRSA02J-102	MGR	1.0K 1/10W
R84	NRSA02J-222	MGR	2.2K 1/10W

Symbol No.	Part No.	Part Name	Description	
R85	NRSA02J-333	MGR	33K	1/10W
R86	NRSA02J-105	MGR	1.0M	1/10W
R87	NRSA02J-682	MGR	6.8K	1/10W
R88	NRSA02J-333	MGR	33K	1/10W
R89	NRSA02J-102	MGR	1.0K	1/10W
R90	NRSA02J-101	MGR	100	1/10W
R91	NRSA02J-223	MGR	22K	1/10W
R92	NRSA02J-152	MGR	1.5K	1/10W
R93	NRSA02J-104	MGR	100K	1/10W
R94	NRSA02J-103	MGR	10K	1/10W
R95	NRSA02J-104	MGR	100K	1/10W
R96	NRSA02J-153	MGR	15K	1/10W
R97	NRSA02J-123	MGR	12K	1/10W
R98	NRSA02J-123	MGR	12K	1/10W
R99	NRSA02J-123	MGR	12K	1/10W
R100	NRSA02J-472	MGR	4.7K	1/10W
R101	NRSA02J-221	MGR	220	1/10W
R102	NRSA02J-683	MGR	68K	1/10W
R103	NRSA02J-393	MGR	39K	1/10W
R104	NRSA02J-563	MGR	56K	1/10W
R105	NRSA02J-333	MGR	33K	1/10W
R106	NRSA02J-103	MGR	10K	1/10W
R107	NRSA02J-393	MGR	39K	1/10W
R108	NRSA02J-103	MGR	10K	1/10W
R109	NRSA02J-222	MGR	2.2K	1/10W
R110	NRSA02J-222	MGR	2.2K	1/10W
R114	NRSA02J-104	MGR	100K	1/10W
R115	NRSA02J-104	MGR	100K	1/10W
R116	NRSA02J-223	MGR	22K	1/10W
R117	NRSA02J-154	MGR	150K	1/10W
R118	NRSA02J-222	MGR	2.2K	1/10W
R119	NRSA02J-222	MGR	2.2K	1/10W
R123	NRSA02J-223	MGR	22K	1/10W
R124	NRSA02J-223	MGR	22K	1/10W
R133	NRSA02J-222	MGR	2.2K	1/10W
R134	NRSA02J-222	MGR	2.2K	1/10W
R137	NRSA02J-392	MGR	3.9K	1/10W
R138	NRSA02J-123	MGR	12K	1/10W
R139	NRSA02J-152	MGR	1.5K	1/10W
R140	NRSA02J-104	MGR	100K	1/10W
R141	NRSA02J-102	MGR	1.0K	1/10W
R142	NRSA02J-152	MGR	1.5K	1/10W
R143	NRSA02J-272	MGR	2.7K	1/10W
R144	NRSA02J-103	MGR	10K	1/10W
R145	NRSA02J-333	MGR	33K	1/10W
R146	NRSA02J-333	MGR	33K	1/10W
R147	NRSA02J-472	MGR	4.7K	1/10W
R148	NRSA02J-122	MGR	1.2K	1/10W
R149	NRSA02J-272	MGR	2.7K	1/10W
R150	NRSA02J-273	MGR	27K	1/10W
R151	NRSA02J-473	MGR	47K	1/10W
R152	NRSA02J-472	MGR	4.7K	1/10W
R153	NRSA02J-472	MGR	4.7K	1/10W
R154	NRSA02J-223	MGR	22K	1/10W
R155	NRSA02J-272	MGR	2.7K	1/10W
R156	NRSA02J-103	MGR	10K	1/10W
R157	NRSA02J-333	MGR	33K	1/10W
R158	NRSA02J-333	MGR	33K	1/10W
R159	NRSA02J-472	MGR	4.7K	1/10W
R160	NRSA02J-123	MGR	12K	1/10W

Symbol No.	Part No.	Part Name	Description	
R161	NRSA02J-392	MGR	3.9K	1/10W
R162	NRSA02J-152	MGR	1.5K	1/10W
R163	NRSA02J-104	MGR	100K	1/10W
R164	NRSA02J-102	MGR	1.0K	1/10W
R165	NRSA02J-152	MGR	1.5K	1/10W
R166	NRSA02J-472	MGR	4.7K	1/10W
R167	NRSA02J-332	MGR	3.3K	1/10W
R168	NRSA02J-272	MGR	2.7K	1/10W
R169	NRSA02J-473	MGR	47K	1/10W
R170	NRSA02J-273	MGR	27K	1/10W
R171	NRSA02J-473	MGR	47K	1/10W
R172	NRSA02J-183	MGR	18K	1/10W
R174	NRSA02J-223	MGR	22K	1/10W
R175	NRSA02J-272	MGR	2.7K	1/10W
R176	NRSA02J-103	MGR	10K	1/10W
R177	NRSA02J-333	MGR	33K	1/10W
R178	NRSA02J-333	MGR	33K	1/10W
R179	NRSA02J-472	MGR	4.7K	1/10W
R180	NRSA02J-473	MGR	47K	1/10W
R181	NRSA02J-332	MGR	3.3K	1/10W
R182	NRSA02J-103	MGR	10K	1/10W
R183	NRSA02J-103	MGR	10K	1/10W
R184	NRSA02J-183	MGR	18K	1/10W
R185	NRSA02J-332	MGR	3.3K	1/10W
R186	NRSA02J-101	MGR	100	1/10W
R187	NRSA02J-562	MGR	5.6K	1/10W
R188	NRSA02J-103	MGR	10K	1/10W
R189	NRSA02J-333	MGR	33K	1/10W
R190	NRSA02J-0R0	MGR	0	1/10W
R191	NRSA02J-682	MGR	6.8K	1/10W
R192	NRSA02J-562	MGR	5.6K	1/10W
R193	NRSA02J-0R0	MGR	0	1/10W
R194	NRSA02J-103	MGR	10K	1/10W
R195	NRSA02J-103	MGR	10K	1/10W
R196	NRSA02J-153	MGR	15K	1/10W
R197	NRSA02J-473	MGR	47K	1/10W
R198	NRSA02J-273	MGR	27K	1/10W
R199	NRSA02J-273	MGR	27K	1/10W
R200	NRSA02J-473	MGR	47K	1/10W
R201	NRSA02J-273	MGR	27K	1/10W
R202	NRSA02J-184	MGR	180K	1/10W
R203	NRSA02J-393	MGR	39K	1/10W
R204	NRSA02J-683	MGR	68K	1/10W
R205	NRSA02J-332	MGR	3.3K	1/10W
R206	NRSA02J-822	MGR	8.2K	1/10W
R207	NRSA02J-391	MGR	390	1/10W
R208	NRSA02J-391	MGR	390	1/10W
R210	NRSA02J-223	MGR	22K	1/10W
R211	NRSA02J-123	MGR	12K	1/10W
R212	NRSA02J-123	MGR	12K	1/10W
R213	NRSA02J-823	MGR	82K	1/10W
R215	NRSA02J-103	MGR	10K	1/10W
R216	NRSA02J-103	MGR	10K	1/10W
R217	NRSA02J-473	MGR	47K	1/10W
R218	NRSA02J-153	MGR	15K	1/10W
R219	NRSA02J-472	MGR	4.7K	1/10W
R220	NRSA02J-472	MGR	4.7K	1/10W
R221	NRSA02J-273	MGR	27K	1/10W
R222	NRSA02J-473	MGR	47K	1/10W
R223	NRSA02J-273	MGR	27K	1/10W

(PR1)

Symbol No.	Part No.	Part Name	Description
R224	NRSA02J-273	MGR	27K 1/10W
R225	NRSA02J-472	MGR	4.7K 1/10W
R226	NRSA02J-472	MGR	4.7K 1/10W
R227	NRSA02J-273	MGR	27K 1/10W
R228	NRSA02J-273	MGR	27K 1/10W
R229	NRSA02J-273	MGR	27K 1/10W
R230	NRSA02J-183	MGR	18K 1/10W
R231	NRSA02J-183	MGR	18K 1/10W
R232	NRSA02J-183	MGR	18K 1/10W
R233	NRSA02J-472	MGR	4.7K 1/10W
R234	NRSA02J-103	MGR	10K 1/10W
R235	NRSA02J-103	MGR	10K 1/10W
R236	NRSA02J-153	MGR	15K 1/10W
R237	NRSA02J-473	MGR	47K 1/10W
R238	NRSA02J-273	MGR	27K 1/10W
R239	NRSA02J-273	MGR	27K 1/10W
R240	NRSA02J-473	MGR	47K 1/10W
R241	NRSA02J-273	MGR	27K 1/10W
R242	NRSA02J-332	MGR	3.3K 1/10W
R243	NRSA02J-183	MGR	18K 1/10W
R244	NRSA02J-153	MGR	15K 1/10W
R245	NRSA02J-392	MGR	3.9K 1/10W
R246	NRSA02J-332	MGR	3.3K 1/10W
R247	NRSA02J-221	MGR	220 1/10W
R248	NRSA02J-223	MGR	22K 1/10W
R249	NRSA02J-562	MGR	5.6K 1/10W
R250	NRSA02J-103	MGR	10K 1/10W
R251	NRSA02J-472	MGR	4.7K 1/10W
R253	NRSA02J-472	MGR	4.7K 1/10W
R254	NRSA02J-332	MGR	3.3K 1/10W
R255	NRSA02J-272	MGR	2.7K 1/10W
R256	NRSA02J-473	MGR	47K 1/10W
R257	NRSA02J-273	MGR	27K 1/10W
R258	NRSA02J-104	MGR	100K 1/10W
R259	NRSA02J-104	MGR	100K 1/10W
R260	NRSA02J-104	MGR	100K 1/10W
R261	NRSA02J-223	MGR	22K 1/10W
R262	NRSA02J-393	MGR	39K 1/10W
R263	NRSA02J-393	MGR	39K 1/10W
R264	NRSA02J-393	MGR	39K 1/10W
R267	NRSA02J-184	MGR	180K 1/10W
R268	NRSA02J-123	MGR	12K 1/10W
R269	NRSA02J-184	MGR	180K 1/10W
R270	NRSA02J-123	MGR	12K 1/10W
R271	NRSA02J-184	MGR	180K 1/10W
R272	NRSA02J-123	MGR	12K 1/10W
R273	NRSA02J-471	MGR	470 1/10W
R274	NRSA02J-333	MGR	33K 1/10W
R275	NRSA02J-471	MGR	470 1/10W
R276	NRSA02J-333	MGR	33K 1/10W
R277	NRSA02J-471	MGR	470 1/10W
R278	NRSA02J-333	MGR	33K 1/10W
R279	NRSA02J-562	MGR	5.6K 1/10W
R280	NRSA02J-562	MGR	5.6K 1/10W
R281	NRSA02J-562	MGR	5.6K 1/10W
R282	NRSA02J-151	MGR	150 1/10W
R283	NRSA02J-332	MGR	3.3K 1/10W
R284	NRSA02J-151	MGR	150 1/10W
R285	NRSA02J-332	MGR	3.3K 1/10W
R286	NRSA02J-151	MGR	150 1/10W

Symbol No.	Part No.	Part Name	Description
R287	NRSA02J-332	MGR	3.3K 1/10W
R288	NRSA02J-0R0	MGR	0 1/10W
R289	NRSA02J-473	MGR	47K 1/10W
R291	NRSA02J-0R0	MGR	0 1/10W
R292	NRSA02J-103	MGR	10K 1/10W
R293	NRSA02J-153	MGR	15K 1/10W
R294	NRSA02J-330	MGR	33 1/10W
R295	NRSA02J-101	MGR	100 1/10W
R296	NRSA02J-101	MGR	100 1/10W
R297	NRSA02J-101	MGR	100 1/10W
R298	NRSA02J-101	MGR	100 1/10W
R299	NRSA02J-224	MGR	220K 1/10W
R302	NRSA02J-103	MGR	10K 1/10W
R303	NRSA02J-683	MGR	68K 1/10W
R304	NRSA02J-223	MGR	22K 1/10W
VR1	NVP1501-502	V.RESISTOR	5K B IN GAIN
VR2	NVP1501-502	V.RESISTOR	5K G IN GAIN
VR3	NVP1501-502	V.RESISTOR	5K R IN GAIN
VR4	NVP1501-103	V.RESISTOR	10K B BLACK BAL
VR5	NVP1501-103	V.RESISTOR	10K G BLACK BAL
VR6	NVP1501-103	V.RESISTOR	10K R BLACK BAL
VR7	NVP1501-102	V.RESISTOR	1K B GAIN
VR8	NVP1501-102	V.RESISTOR	1K R GAIN
VR9	NVP1501-103	V.RESISTOR	10K B KNEE
VR10	NVP1501-103	V.RESISTOR	10K B BLACK
VR11	NVP1501-103	V.RESISTOR	10K R KNEE
VR12	NVP1501-103	V.RESISTOR	10K R BLACK
VR13	NVP1501-502	V.RESISTOR	5K B W.CLIP
VR14	NVP1501-502	V.RESISTOR	5K G W.CLIP
VR15	NVP1501-502	V.RESISTOR	5K R W.CLIP
VR16	NVP1501-103	V.RESISTOR	10K B GAMMA
VR17	NVP1501-103	V.RESISTOR	10K R GAMMA
VR21	NVP1501-203	V.RESISTOR	20K G DY.V.SAW
VR22	NVP1501-203	V.RESISTOR	20K R DY.V.SAW
VR26	NVP1501-203	V.RESISTOR	20K G DY.V.PARA
VR27	NVP1501-203	V.RESISTOR	20K R DY.V.PARA
VR31	NVP1501-103	V.RESISTOR	10K AUTO KNEE
C1	NEA11CM-476	E CAP	47 16V
C2	NEA10JM-107	E CAP	100 6.3V
C3	NEA10JM-107	E CAP	100 6.3V
C4	NEA11CM-476	E CAP	47 16V
C5	NEA11CM-476	E CAP	47 16V
C6	NEA11CM-476	E CAP	47 16V
C7	NEA10GM-476	E CAP	47 4V
C8	NCT03CH-9R0	C CAP	9.0P 50V
C9	NEF11AM-475	T CAP	4.7 10V
C10	NCT03CH-180	C CAP	18P 50V
C11	NEN10JM-476	NP CAP	47 6.3V
C12	NEF11VM-104	T CAP	0.10 35V
C14	NCF21EZ-104	C CAP	0.10 25V
C15	NCT03CH-470	C CAP	47P 50V
C16	NCF21EZ-104	C CAP	0.10 25V
C19	NCF21EZ-104	C CAP	0.10 25V
C20	NCF21EZ-104	C CAP	0.10 25V
C21	NEA11CM-476	E CAP	47 16V
C22	NEA10GM-476	E CAP	47 4V
C23	NCT03CH-9R0	C CAP	9.0P 50V

Symbol No.	Part No.	Part Name	Description	
C24	NEF11AM-475	T CAP	4.7	10V
C25	NCT03CH-180	C CAP	18P	50V
C26	NEN10JM-476	NP CAP	47	6.3V
C27	NEF11VM-104	T CAP	0.10	35V
C29	NCF21EZ-104	C CAP	0.10	25V
C30	NCT03CH-470	C CAP	47P	50V
C31	NCF21EZ-104	C CAP	0.10	25V
C34	NCF21EZ-104	C CAP	0.10	25V
C35	NCF21EZ-104	C CAP	0.10	25V
C36	NEA11CM-476	E CAP	47	16V
C37	NEA10GM-476	E CAP	47	4V
C38	NCT03CH-9R0	C CAP	9.0P	50V
C39	NEF11AM-475	T CAP	4.7	10V
C40	NCT03CH-180	C CAP	18P	50V
C41	NEN10JM-476	NP CAP	47	6.3V
C42	NEF11VM-104	T CAP	0.10	35V
C44	NCF21EZ-104	C CAP	0.10	25V
C45	NCT03CH-470	C CAP	47P	50V
C46	NCF21EZ-104	C CAP	0.10	25V
C49	NCF21EZ-104	C CAP	0.10	25V
C50	NCF21EZ-104	C CAP	0.10	25V
C51	NEA10GM-476	E CAP	47	4V
C52	NEA10GM-476	E CAP	47	4V
C53	NCF21EZ-104	C CAP	0.10	25V
C54	NCF21EZ-104	C CAP	0.10	25V
C55	NEA11CM-476	E CAP	47	16V
C56	NEF11VM-105	T CAP	1.0	35V
C57	NEN11AM-106	NP CAP	10	10V
C58	NEF11VM-105	T CAP	1.0	35V
C59	NEN11AM-106	NP CAP	10	10V
C60	NCF21EZ-104	C CAP	0.10	25V
C66	NCF21EZ-104	C CAP	0.10	25V
C67	NEA11AM-336	E CAP	33	10V
C68	NCF21EZ-104	C CAP	0.10	25V
C69	NCF21EZ-104	C CAP	0.10	25V
C70	NCF21EZ-104	C CAP	0.10	25V
C71	NCF21HZ-333	C CAP	0.033	50V
C72	NCF21HZ-333	C CAP	0.033	50V
C73	NEF11CM-105	T CAP	1.0	16V
C74	NEF11CM-105	T CAP	1.0	16V
C75	NEA10JM-107	E CAP	100	6.3V
C76	NEA10JM-107	E CAP	100	6.3V
C77	NEF11EM-475	T CAP	4.7	25V
C78	NCF21HZ-333	C CAP	0.033	50V
C80	NEF11CM-105	T CAP	1.0	16V
C81	NEA10JM-107	E CAP	100	6.3V
C82	NEF11CM-105	T CAP	1.0	16V
C83	NEA10JM-107	E CAP	100	6.3V
C84	NCF21EZ-104	C CAP	0.10	25V
C85	NCF21EZ-104	C CAP	0.10	25V
C86	NEN11AM-106	NP CAP	10	10V
C87	NCF21EZ-104	C CAP	0.10	25V
C88	NCF21EZ-104	C CAP	0.10	25V
C89	NEA11AM-336	E CAP	33	10V
C90	NCF21EZ-104	C CAP	0.10	25V
C91	NCF21EZ-104	C CAP	0.10	25V
C92	NCF21HZ-333	C CAP	0.033	50V
C93	NCF21HZ-333	C CAP	0.033	50V
C94	NEF11CM-105	T CAP	1.0	16V
C95	NEF11CM-105	T CAP	1.0	16V
C96	NEA10JM-107	E CAP	100	6.3V
C97	NEA10JM-107	E CAP	100	6.3V
C98	NEF11EM-475	T CAP	4.7	25V
C99	NCF21HZ-333	C CAP	0.033	50V
C101	NEF11CM-105	T CAP	1.0	16V
C102	NEA10JM-107	E CAP	100	6.3V
C103	NEF11CM-105	T CAP	1.0	16V
C104	NEA10JM-107	E CAP	100	6.3V
C105	NCF21EZ-104	C CAP	0.10	25V
C106	NCF21EZ-104	C CAP	0.10	25V
C107	NEN11AM-106	NP CAP	10	10V
C108	NCF21EZ-104	C CAP	0.10	25V
C109	NCF21EZ-104	C CAP	0.10	25V
C110	NEA11AM-336	E CAP	33	10V
C111	NCF21EZ-104	C CAP	0.10	25V
C112	NCF21EZ-104	C CAP	0.10	25V
C113	NCF21EZ-104	C CAP	0.10	25V
C114	NCF21HZ-333	C CAP	0.033	50V
C115	NCF21HZ-333	C CAP	0.033	50V
C116	NEF11CM-105	T CAP	1.0	16V
C117	NEF11CM-105	T CAP	1.0	16V
C118	NEA10JM-107	E CAP	100	6.3V
C119	NEA10JM-107	E CAP	100	6.3V
C120	NEF11EM-475	T CAP	4.7	25V
C121	NCF21HZ-333	C CAP	0.033	50V
C123	NEF11CM-105	T CAP	1.0	16V
C124	NEA10JM-107	E CAP	100	6.3V
C125	NEF11CM-105	T CAP	1.0	16V
C126	NEA10JM-107	E CAP	100	6.3V
C127	NCF21EZ-104	C CAP	0.10	25V
C128	NCF21EZ-104	C CAP	0.10	25V
C129	NEN11AM-106	NP CAP	10	10V
C130	NCF21EZ-104	C CAP	0.10	25V
C131	NCF21EZ-104	C CAP	0.10	25V
C132	NCF21EZ-104	C CAP	0.10	25V
C133	NCF21EZ-104	C CAP	0.10	25V
C134	NCF21EZ-104	C CAP	0.10	25V
C135	NEA11AM-336	E CAP	33	10V
C136	NCF21EZ-104	C CAP	0.10	25V
C137	NEF11EM-475	T CAP	4.7	25V
C138	NEF11AM-106	T CAP	10	10V
C139	NCF21EZ-104	C CAP	0.10	25V
C140	NCF21EZ-104	C CAP	0.10	25V
C141	NEN11AM-106	NP CAP	10	10V
C142	NCF21EZ-104	C CAP	0.10	25V
C143	NCF21EZ-104	C CAP	0.10	25V
C144	NCF21EZ-104	C CAP	0.10	25V
C145	NCF21EZ-104	C CAP	0.10	25V
C146	NCF21EZ-104	C CAP	0.10	25V
C147	NCF21EZ-104	C CAP	0.10	25V
C148	NCF21EZ-104	C CAP	0.10	25V
C149	NCF21EZ-104	C CAP	0.10	25V
C150	NEA11AM-336	E CAP	33	10V
C151	NEA11AM-336	E CAP	33	10V
C152	NCF21EZ-104	C CAP	0.10	25V
C153	NCF21EZ-104	C CAP	0.10	25V
C154	NCF21EZ-104	C CAP	0.10	25V
C155	NCF21EZ-104	C CAP	0.10	25V
C156	NCF21EZ-104	C CAP	0.10	25V
C157	NCF21EZ-104	C CAP	0.10	25V

(PR1)

Symbol No.	Part No.	Part Name	Description
C158	NCF21EZ-104	C CAP	0.10 25V
C159	NCF21EZ-104	C CAP	0.10 25V
C160	QETA1AM-477	E CAP	470 10V
C161	NCF21EZ-104	C CAP	0.10 25V
C162	NCF21EZ-104	C CAP	0.10 25V
C163	NCF21EZ-104	C CAP	0.10 25V
C164	NCF21EZ-104	C CAP	0.10 25V
C165	NCF21EZ-104	C CAP	0.10 25V
C166	NCF21EZ-104	C CAP	0.10 25V
C167	NCF21EZ-104	C CAP	0.10 25V
C168	NCF21EZ-104	C CAP	0.10 25V
C169	NCF21EZ-104	C CAP	0.10 25V
C170	NCF21EZ-104	C CAP	0.10 25V
C171	NCF21EZ-104	C CAP	0.10 25V
C172	NCF21EZ-104	C CAP	0.10 25V
C173	NCF21EZ-104	C CAP	0.10 25V
C174	NCF21EZ-104	C CAP	0.10 25V
C175	NCF21EZ-104	C CAP	0.10 25V
C176	NCF21EZ-104	C CAP	0.10 25V
C177	NCF21EZ-104	C CAP	0.10 25V
C178	NCF21EZ-104	C CAP	0.10 25V
C179	NCTO3CH-221	C CAP	220P 50V
C180	NCTO3CH-221	C CAP	220P 50V
C181	NCTO3CH-221	C CAP	220P 50V
C182	NCTO3CH-390	C CAP	39P 50V
C183	NCF21EZ-104	C CAP	0.10 25V
L2	SSV1330-150	COIL	15μ
L3	SSV1330-150	COIL	15μ
L4	SCV0983-500	PEAKING COIL	50μ
L5	SCV1488-120	PEAKING COIL	12μ
L6	SCV1488-120	PEAKING COIL	12μ
L7	SCV1488-120	PEAKING COIL	12μ
L8	SCV1488-221	PEAKING COIL	220μ
L13	SCV1488-221	PEAKING COIL	220μ
L18	SCV1488-221	PEAKING COIL	220μ
DL1	SCV1253-001	DELAY LINE	
DL2	SCV1253-001	DELAY LINE	
DL3	SCV1253-001	DELAY LINE	
DL4	SCV1253-001	DELAY LINE	
DL5	SCV1253-001	DELAY LINE	
CN1	SCV1770-003	CONNECTOR	3 pin
CN2	SCV1770-003	CONNECTOR	3 pin
CN3	SCV1770-003	CONNECTOR	3 pin
CN9	SCV1849-030	CONNECTOR	30 pin
CN50	SCV1814-024	CONNECTOR	24 pin

7.7 PR2 board assembly 57

57☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	RC1496M	I.C.(M)	RAYTHEON
IC2	RC1496M	I.C.(M)	RAYTHEON
IC3	RC1496M	I.C.(M)	RAYTHEON
IC4	RC4556M	I.C.(M)	RAYTHEON
IC5	RC4556M	I.C.(M)	RAYTHEON
IC6	RC4556M	I.C.(M)	RAYTHEON
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q2	CXD7500M	FET	SONY
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q4	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q5	2SK198(Q.R)	FET	MATSUSHITA
Q6	2SA1179(M6)	TRANSISTOR	SANYO
Q7	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q8	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q9	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q11	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q12	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q13	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q14	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q15	CXD7500M	FET	SONY
Q16	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q17	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q18	2SK198(Q.R)	FET	MATSUSHITA
Q19	2SA1179(M6)	TRANSISTOR	SANYO
Q20	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q21	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q22	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q24	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q25	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q26	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q27	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q28	CXD7500M	FET	SONY
Q29	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q30	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q31	2SK198(Q.R)	FET	MATSUSHITA
Q32	2SA1179(M6)	TRANSISTOR	SANYO
Q33	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q34	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q35	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q37	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q38	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q39	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
D1	MA153	DIODE	MATSUSHITA
D2	MA153	DIODE	MATSUSHITA
D3	MA153	DIODE	MATSUSHITA
R1	NRSA02J-471	MGR	470 1/10W
R2	NRSA02J-182	MGR	1.8K 1/10W
R3	NRSA02J-104	MGR	100K 1/10W
R4	NRSA02J-822	MGR	8.2K 1/10W
R5	NRSA02J-332	MGR	3.3K 1/10W
R6	NRSA02J-182	MGR	1.8K 1/10W
R8	NRSA02J-472	MGR	4.7K 1/10W
R9	NRSA02J-333	MGR	33K 1/10W
R10	NRSA02J-103	MGR	10K 1/10W
R11	NRSA02J-223	MGR	22K 1/10W

Symbol No.	Part No.	Part Name	Description
R12	NRSA02J-183	MGR	18K 1/10W
R13	NRSA02J-272	MGR	2.7K 1/10W
R14	NRSA02J-272	MGR	2.7K 1/10W
R15	NRSA02J-101	MGR	100 1/10W
R16	NRSA02J-101	MGR	100 1/10W
R17	NRSA02J-332	MGR	3.3K 1/10W
R18	NRSA02J-563	MGR	56K 1/10W
R19	NRSA02J-221	MGR	220 1/10W
R20	NRSA02J-222	MGR	2.2K 1/10W
R21	NRSA02J-223	MGR	22K 1/10W
R22	NRSA02J-332	MGR	3.3K 1/10W
R23	NRSA02J-472	MGR	4.7K 1/10W
R24	NRSA02J-332	MGR	3.3K 1/10W
R25	NRSA02J-332	MGR	3.3K 1/10W
R26	NRSA02J-562	MGR	5.6K 1/10W
R27	NRSA02J-562	MGR	5.6K 1/10W
R28	NRSA02J-562	MGR	5.6K 1/10W
R29	NRSA02J-472	MGR	4.7K 1/10W
R30	NRSA02J-392	MGR	3.9K 1/10W
R31	NRSA02J-103	MGR	10K 1/10W
R33	NRSA02J-393	MGR	39K 1/10W
R34	NRSA02J-103	MGR	10K 1/10W
R35	NRSA02J-471	MGR	470 1/10W
R36	NRSA02J-182	MGR	1.8K 1/10W
R37	NRSA02J-104	MGR	100K 1/10W
R38	NRSA02J-822	MGR	8.2K 1/10W
R39	NRSA02J-332	MGR	3.3K 1/10W
R40	NRSA02J-182	MGR	1.8K 1/10W
R42	NRSA02J-472	MGR	4.7K 1/10W
R43	NRSA02J-333	MGR	33K 1/10W
R44	NRSA02J-103	MGR	10K 1/10W
R45	NRSA02J-223	MGR	22K 1/10W
R46	NRSA02J-183	MGR	18K 1/10W
R47	NRSA02J-222	MGR	2.2K 1/10W
R48	NRSA02J-272	MGR	2.7K 1/10W
R49	NRSA02J-101	MGR	100 1/10W
R50	NRSA02J-101	MGR	100 1/10W
R51	NRSA02J-332	MGR	3.3K 1/10W
R52	NRSA02J-221	MGR	220 1/10W
R53	NRSA02J-222	MGR	2.2K 1/10W
R54	NRSA02J-332	MGR	3.3K 1/10W
R55	NRSA02J-472	MGR	4.7K 1/10W
R56	NRSA02J-103	MGR	10K 1/10W
R57	NRSA02J-332	MGR	3.3K 1/10W
R58	NRSA02J-332	MGR	3.3K 1/10W
R59	NRSA02J-562	MGR	5.6K 1/10W
R60	NRSA02J-562	MGR	5.6K 1/10W
R61	NRSA02J-562	MGR	5.6K 1/10W
R62	NRSA02J-472	MGR	4.7K 1/10W
R63	NRSA02J-392	MGR	3.9K 1/10W
R64	NRSA02J-103	MGR	10K 1/10W
R66	NRSA02J-393	MGR	39K 1/10W
R67	NRSA02J-471	MGR	470 1/10W
R68	NRSA02J-182	MGR	1.8K 1/10W
R69	NRSA02J-104	MGR	100K 1/10W
R70	NRSA02J-822	MGR	8.2K 1/10W
R71	NRSA02J-332	MGR	3.3K 1/10W
R72	NRSA02J-182	MGR	1.8K 1/10W
R74	NRSA02J-472	MGR	4.7K 1/10W
R75	NRSA02J-333	MGR	33K 1/10W

Symbol No.	Part No.	Part Name	Description
R76	NRSA02J-103	MGR	10K 1/10W
R77	NRSA02J-223	MGR	22K 1/10W
R78	NRSA02J-183	MGR	18K 1/10W
R79	NRSA02J-222	MGR	2.2K 1/10W
R80	NRSA02J-272	MGR	2.7K 1/10W
R81	NRSA02J-101	MGR	100 1/10W
R82	NRSA02J-101	MGR	100 1/10W
R83	NRSA02J-332	MGR	3.3K 1/10W
R84	NRSA02J-563	MGR	56K 1/10W
R85	NRSA02J-221	MGR	220 1/10W
R86	NRSA02J-222	MGR	2.2K 1/10W
R87	NRSA02J-223	MGR	22K 1/10W
R88	NRSA02J-332	MGR	3.3K 1/10W
R89	NRSA02J-472	MGR	4.7K 1/10W
R90	NRSA02J-103	MGR	10K 1/10W
R91	NRSA02J-332	MGR	3.3K 1/10W
R92	NRSA02J-332	MGR	3.3K 1/10W
R93	NRSA02J-562	MGR	5.6K 1/10W
R94	NRSA02J-562	MGR	5.6K 1/10W
R95	NRSA02J-562	MGR	5.6K 1/10W
R96	NRSA02J-472	MGR	4.7K 1/10W
R97	NRSA02J-392	MGR	3.9K 1/10W
R98	NRSA02J-103	MGR	10K 1/10W
R100	NRSA02J-393	MGR	39K 1/10W
R101	NRSA02J-103	MGR	10K 1/10W
R111	NRSA02J-473	MGR	47K 1/10W
R112	NRSA02J-183	MGR	18K 1/10W
R114	NRSA02J-393	MGR	39K 1/10W
R117	NRSA02J-393	MGR	39K 1/10W
R120	NRSA02J-393	MGR	39K 1/10W
VR1	NVP1501-202	V.RESISTOR	2K B r IN GAIN
VR2	NVP1501-202	V.RESISTOR	2K G r IN GAIN
VR3	NVP1501-202	V.RESISTOR	2K R r IN GAIN
C1	NEA11CM-476	E CAP	47 16V
C2	NEA10JM-107	E CAP	100 6.3V
C3	NEA10JM-107	E CAP	100 6.3V
C4	NCF21EZ-104	C CAP	0.10 25V
C5	NCF21HZ-103	C CAP	0.010 50V
C6	NEF11CM-105	T CAP	1.0 16V
C7	NEN11HM-105	NP CAP	1.0 50V
C8	NEA11AM-336	E CAP	33 10V
C9	NCF21EZ-104	C CAP	0.10 25V
C11	NCF21EZ-104	C CAP	0.10 25V
C12	NCF21EZ-104	C CAP	0.10 25V
C13	NCF21EZ-104	C CAP	0.10 25V
C14	NCF21EZ-104	C CAP	0.10 25V
C15	NCF21HZ-103	C CAP	0.010 50V
C16	NEF11CM-105	T CAP	1.0 16V
C17	NEN11HM-105	NP CAP	1.0 50V
C18	NEA11AM-336	E CAP	33 10V
C19	NCF21EZ-104	C CAP	0.10 25V
C21	NCF21EZ-104	C CAP	0.10 25V
C22	NEN10JM-476	NP CAP	47 6.3V
C23	NCF21EZ-104	C CAP	0.10 25V
C24	NCF21EZ-104	C CAP	0.10 25V
C25	NCF21HZ-103	C CAP	0.010 50V
C26	NEF11CM-105	T CAP	1.0 16V

7.8 SECC board assembly 5 8

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Symbol No.	Part No.	Part Name	Description
C27	NEN11HM-105	NP CAP	1.0 50V
C28	NEA11AM-336	E CAP	33 10V
C29	NCF21EZ-104	C CAP	0.10 25V
C31	NCF21EZ-104	C CAP	0.10 25V
C32	NEN10JM-476	NP CAP	47 6.3V
C33	NCF21EZ-104	C CAP	0.10 25V
C34	NCF21EZ-104	C CAP	0.10 25V
C35	NEA10JM-107	E CAP	100 6.3V
C36	NCF21EZ-104	C CAP	0.10 25V
C37	NCF21EZ-104	C CAP	0.10 25V
C38	NCF21EZ-104	C CAP	0.10 25V
C39	NCF21EZ-104	C CAP	0.10 25V
C40	NCF21EZ-104	C CAP	0.10 25V
C41	NCF21EZ-104	C CAP	0.10 25V
C42	NCF21EZ-104	C CAP	0.10 25V
C43	NEF11AM-106	T CAP	10 10V
C44	NCT03CH-100	C CAP	10P 50V
C45	NCF21EZ-104	C CAP	0.10 25V
C46	NEF11AM-106	T CAP	10 10V
C47	NEF11AM-106	T CAP	10 10V
C48	NCT03CH-100	C CAP	10P 50V
C49	NCF21EZ-104	C CAP	0.10 25V
C50	NEF11AM-106	T CAP	10 10V
C51	NEF11AM-106	T CAP	10 10V
C52	NCT03CH-100	C CAP	10P 50V
C53	NCF21EZ-104	C CAP	0.10 25V
C54	NEF11AM-106	T CAP	10 10V
CN50	SCV1934-24	CONNECTOR	24 pin

Symbol No.	Part No.	Part Name	Description
IC1	CXL1009P	I.C.(M)	SONY
IC2	CXL1009P	I.C.(M)	SONY
IC3	RC4558MB	I.C.(M)	RAYTHEON
IC4	RC1496M	I.C.(M)	RAYTHEON
IC5	TC4S66F	I.C.(M)	TOSHIBA
IC6	JCS0001	I.C.(M)	JVC
IC7	JCS0002	I.C.(M)	JVC
IC8	MC14053BF	I.C.(M)	MOTOROLA
IC9	TC7SU04F	I.C.(M)	TOSHIBA
IC10	TC40H004F	I.C.(M)	TOSHIBA
IC11	TC50H000F	I.C.(M)	TOSHIBA
IC12	TC7SU04F	I.C.(M)	TOSHIBA
IC13	TC74HC40103AF	I.C.(M)	TOSHIBA
IC14	TC74HC40103AF	I.C.(M)	TOSHIBA
IC15	TC4538BF	I.C.(M)	TOSHIBA (TC)
IC16	TC4538BF	I.C.(M)	TOSHIBA (TC
IC17	MC14046BF	I.C.(M)	MOTOROLA (TC)
IC18	RC062M	I.C.(M)	JRC (TC)
IC19	HA11247MPEL	I.C.(M)	HITACHI (TC)
IC20	RC062M	I.C.(M)	JRC
IC21	MC14094BF	I.C.(M)	MOTOROLA
IC22	TC4S01F	I.C.(M)	TOSHIBA
IC23	TC4S81F	I.C.(M)	TOSHIBA
IC24	TC4S71F	I.C.(M)	TOSHIBA
IC25	TC4S81F	I.C.(M)	TOSHIBA
IC26	SCV0270-001	I.C.(H)	JVC
IC27	MC74HC74AF	I.C.(M)	MOTOROLA (TC)
IC28	AN614	I.C.(M)	MATSUSHITA
IC29	AN614	I.C.(M)	MATSUSHITA
IC30	MC14053BF	I.C.(M)	MOTOROLA
IC31	TC7S00F	I.C.(M)	TOSHIBA
IC32	MC14053BF	I.C.(M)	MOTOROLA
IC33	TC7SU04F	I.C.(M)	TOSHIBA
Q1	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q2	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q4	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q5	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q6	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q7	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q8	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q9	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q10	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q11	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q12	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q13	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q14	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q15	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q16	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q17	2SJ84(Q.R)	FET	MATSUSHITA
Q18	DTC124EK	TRANSISTOR	ROHM
Q19	DTC124EK	TRANSISTOR	ROHM
Q21	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q22	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q23	2SA1022(B.C)	TRANSISTOR	MATSUSHITA (TC)
Q24	2SA1022(B.C)	TRANSISTOR	MATSUSHITA (TC)
Q25	2SC2295(B.C)	TRANSISTOR	MATSUSHITA (TC)
Q26	2SC2295(B.C)	TRANSISTOR	MATSUSHITA (TC)

Symbol No.	Part No.	Part Name	Description
Q27	DTC124EK	TRANSISTOR	ROHM (TC)
Q28	2SB710(Q.R)	TRANSISTOR	MATSUSHITA (TC)
Q36	2SC2295(B.C)	TRANSISTOR	MATSUSHITA (TC)
Q37	DTC124EK	TRANSISTOR	ROHM
Q38	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q41	DTA124EK	TRANSISTOR	ROHM
Q42	2SC2295(B.C)	TRANSISTOR	MATSUSHITA (TC)
Q43	DTA124EK	TRANSISTOR	ROHM
Q44	DTC124EK	TRANSISTOR	ROHM
Q50	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q51	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q52	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q53	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q54	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q55	2SK198(Q.R)	FET	MATSUSHITA
Q56	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q57	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q58	2SK198(Q.R)	FET	MATSUSHITA
Q59	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q60	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q61	2SK198(Q.R)	FET	MATSUSHITA
Q62	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q63	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q64	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q65	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q66	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q67	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q68	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q69	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q70	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q71	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q72	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q73	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q74	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q75	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q76	2SK198(Q.R)	FET	MATSUSHITA
Q77	2SK198(Q.R)	FET	MATSUSHITA
Q78	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q79	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q80	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q81	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q82	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q83	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q84	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q85	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q86	2SD602(Q.R)	TRANSISTOR	MATSUSHITA
Q87	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q88	2SK198(Q.R)	FET	MATSUSHITA
Q89	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q90	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q91	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q92	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q93	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q94	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q95	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q96	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
D1	HSM88AS	SI DIODE	HITACHI

Symbol No.	Part No.	Part Name	Description	
D2	HSM88AS	SI DIODE	HITACHI	
D3	FC-54M	VARI.CAP.DIODE	FUJITSU	
D4	FC-52M	VARI.CAP.DIODE	FUJITSU	
D5	MA153	DIODE	MATSUSHITA	
D6	MA152A	DIODE	MATSUSHITA	
D7	FC-54M	VARI.CAP.DIODE	FUJITSU	
D8	MA152A	DIODE	MATSUSHITA (TC)	
D9	MA152A	DIODE	MATSUSHITA (TC)	
D10	MA152A	DIODE	MATSUSHITA (TC)	
D11	HZM6CTR	ZENER DIODE	HITACHI	
R1	NRSA02J-151	MGR	150	1/10W
R2	NRSA02J-152	MGR	1.5K	1/10W
R3	NRSA02J-471	MGR	470	1/10W
R4	NRSA02J-152	MGR	1.5K	1/10W
R5	NRSA02J-391	MGR	390	1/10W
R6	NRSA02J-332	MGR	3.3K	1/10W
R7	NRSA02J-391	MGR	390	1/10W
R8	NRSA02J-332	MGR	3.3K	1/10W
R9	NRSA02J-102	MGR	1.0K	1/10W
R10	NRSA02J-332	MGR	3.3K	1/10W
R11	NRSA02J-562	MGR	5.6K	1/10W
R12	NRSA02J-105	MGR	1.0M	1/10W
R13	NRSA02J-105	MGR	1.0M	1/10W
R14	NRSA02J-224	MGR	220K	1/10W
R15	NRSA02J-224	MGR	220K	1/10W
R16	NRSA02J-101	MGR	100	1/10W
R17	NRSA02J-102	MGR	1.0K	1/10W
R18	NRSA02J-151	MGR	150	1/10W
R19	NRSA02J-102	MGR	1.0K	1/10W
R20	NRSA02J-391	MGR	390	1/10W
R22	NRSA02J-391	MGR	390	1/10W
R24	NRSA02J-152	MGR	1.5K	1/10W
R25	NRSA02J-392	MGR	3.9K	1/10W
R26	NRSA02J-681	MGR	680	1/10W
R27	NRSA02J-102	MGR	1.0K	1/10W
R28	NRSA02J-102	MGR	1.0K	1/10W
R29	NRSA02J-562	MGR	5.6K	1/10W
R30	NRSA02J-102	MGR	1.0K	1/10W
R31	NRSA02J-102	MGR	1.0K	1/10W
R32	NRSA02J-152	MGR	1.5K	1/10W
R33	NRSA02J-105	MGR	1.0M	1/10W
R34	NRSA02J-105	MGR	1.0M	1/10W
R35	NRSA02J-224	MGR	220K	1/10W
R36	NRSA02J-224	MGR	220K	1/10W
R37	NRSA02J-101	MGR	100	1/10W
R38	NRSA02J-102	MGR	1.0K	1/10W
R39	NRSA02J-151	MGR	150	1/10W
R40	NRSA02J-102	MGR	1.0K	1/10W
R41	NRSA02J-102	MGR	1.0K	1/10W
R42	NRSA02J-102	MGR	1.0K	1/10W
R43	NRSA02J-152	MGR	1.5K	1/10W
R44	NRSA02J-392	MGR	3.9K	1/10W
R45	NRVA02D-103	MFR	10K	1/10W
R46	NRSA02J-101	MGR	100	1/10W
R47	NRSA02J-152	MGR	1.5K	1/10W
R48	NRSA02J-472	MGR	4.7K	1/10W
R49	NRSA02J-472	MGR	4.7K	1/10W
R50	NRSA02J-470	MGR	47	1/10W

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Symbol No.	Part No.	Part Name	Description	
R51	NRSA02J-681	MGR	680	1/10W
R52	NRVA02D-103	MFR	10K	1/10W
R53	NRVA02D-103	MFR	10K	1/10W
R54	NRSA02J-104	MGR	100K	1/10W
R55	NRSA02J-472	MGR	4.7K	1/10W
R56	NRSA02J-682	MGR	6.8K	1/10W
R57	NRSA02J-0R0	MGR	0	1/10W
R58	NRSA02J-102	MGR	1.0K	1/10W
R59	NRSA02J-472	MGR	4.7K	1/10W
R60	NRSA02J-682	MGR	6.8K	1/10W
R61	NRSA02J-102	MGR	1.0K	1/10W
R62	NRSA02J-472	MGR	4.7K	1/10W
R63	NRVA02D-272	MFR	2.7K	1/10W
R64	NRSA02J-563	MGR	56K	1/10W
R65	NRSA02J-223	MGR	22K	1/10W
R66	NRSA02J-333	MGR	33K	1/10W
R67	NRSA02J-183	MGR	18K	1/10W
R68	NRSA02J-183	MGR	18K	1/10W
R69	NRSA02J-123	MGR	12K	1/10W
R70	NRSA02J-104	MGR	100K	1/10W
R71	NRSA02J-104	MGR	100K	1/10W
R72	NRSA02J-105	MGR	1.0M	1/10W
R73	NRSA02J-152	MGR	1.5K	1/10W
R75	NRSA02J-333	MGR	33K	1/10W
R76	NRSA02J-123	MGR	12K	1/10W
R78	NRSA02J-121	MGR	120	1/10W
R79	NRSA02J-102	MGR	1.0K	1/10W
R80	NRSA02J-152	MGR	1.5K	1/10W
R81	NRSA02J-105	MGR	1.0M	1/10W
R82	NRSA02J-104	MGR	100K	1/10W
R83	NRVA02D-103	MFR	10K	1/10W
R84	NRVA02D-103	MFR	10K	1/10W
R85	NRSA02J-104	MGR	100K	1/10W
R88	NRSA02J-0R0	MGR	0	1/10W
R91	NRSA02J-332	MGR	3.3K	1/10W
R92	NRVA02D-103	MFR	10K	1/10W
R93	NRSA02J-153	MGR	15K	1/10W
R94	NRSA02J-101	MGR	100	1/10W
R95	NRSA02J-102	MGR	1.0K	1/10W
R96	NRSA02J-471	MGR	470	1/10W
R97	NRSA02J-393	MGR	39K	1/10W
R98	NRSA02J-273	MGR	27K	1/10W
R99	NRSA02J-563	MGR	56K	1/10W
R100	NRSA02J-124	MGR	120K	1/10W
R103	NRSA02J-0R0	MGR	0	1/10W
R104	NRSA02J-0R0	MGR	0	1/10W
R108	NRSA02J-105	MGR	1.0M	1/10W
R109	NRSA02J-104	MGR	100K	1/10W
R110	NRSA02J-102	MGR	1.0K	1/10W
R111	NRSA02J-102	MGR	1.0K	1/10W
R112	NRSA02J-102	MGR	1.0K	1/10W
R113	NRSA02J-822	MGR	8.2K	1/10W
R114	NRSA02J-105	MGR	1.0M	1/10W
R115	NRSA02J-153	MGR	15K	1/10W
R116	NRSA02J-101	MGR	100	1/10W
R117	NRSA02J-0R0	MGR	0	1/10W(X1)
R118	NRSA02J-0R0	MGR	0	1/10W(TC)
R121	NRVA02D-103	MFR	10K	1/10W(TC)
R122	NRSA02J-393	MGR	39K	1/10W(TC)
R123	NRSA02J-102	MGR	1.0K	1/10W(TC)
R124	NRSA02J-102	MGR	1.0K	1/10W(TC)
R125	NRSA02J-560	MGR	56	1/10W(TC)
R126	NRSA02J-561	MGR	560	1/10W(TC)
R127	NRSA02J-222	MGR	2.2K	1/10W(TC)
R128	NRSA02J-102	MGR	1.0K	1/10W(TC)
R129	NRSA02J-105	MGR	1.0M	1/10W(TC)
R130	NRVA02D-103	MFR	10K	1/10W(TC)
R132	NRSA02J-332	MGR	3.3K	1/10W(TC)
R133	NRSA02J-332	MGR	3.3K	1/10W(TC)
R134	NRVA02D-103	MFR	10K	1/10W(TC)
R135	NRSA02J-822	MGR	8.2K	1/10W(TC)
R136	NRSA02J-222	MGR	2.2K	1/10W(TC)
R137	NRVA02D-103	MFR	10K	1/10W(TC)
R138	NRSA02J-563	MGR	56K	1/10W(TC)
R139	NRSA02J-332	MGR	3.3K	1/10W(TC)
R140	NRSA02J-563	MGR	56K	1/10W(TC)
R141	NRSA02J-332	MGR	3.3K	1/10W(TC)
R142	NRSA02J-102	MGR	1.0K	1/10W(TC)
R143	NRSA02J-393	MGR	39K	1/10W(TC)
R144	NRSA02J-273	MGR	27K	1/10W(TC)
R145	NRSA02J-563	MGR	56K	1/10W(TC)
R146	NRSA02J-124	MGR	120K	1/10W(TC)
R151	NRVA02D-103	MFR	10K	1/10W
R152	NRSA02J-682	MGR	6.8K	1/10W(TC)
R153	NRSA02J-222	MGR	2.2K	1/10W(TC)
R154	NRSA02J-222	MGR	2.2K	1/10W(TC)
R155	NRSA02J-102	MGR	1.0K	1/10W(TC)
R162	NRSA02J-561	MGR	560	1/10W(TC)
R163	NRSA02J-102	MGR	1.0K	1/10W(TC)
R164	NRSA02J-821	MGR	820	1/10W(TC)
R165	NRSA02J-152	MGR	1.5K	1/10W(TC)
R166	NRSA02J-271	MGR	270	1/10W(TC)
R167	NRSA02J-563	MGR	56K	1/10W(TC)
R168	NRVA02D-103	MFR	10K	1/10W(TC)
R169	NRSA02J-123	MGR	12K	1/10W(TC)
R170	NRSA02J-821	MGR	820	1/10W(TC)
R171	NRSA02J-332	MGR	3.3K	1/10W(TC)
R172	NRSA02J-682	MGR	6.8K	1/10W(TC)
R173	NRSA02J-562	MGR	5.6K	1/10W(TC)
R174	NRSA02J-562	MGR	5.6K	1/10W(TC)
R175	NRSA02J-224	MGR	220K	1/10W(TC)
R176	NRSA02J-472	MGR	4.7K	1/10W(TC)
R177	NRSA02J-472	MGR	4.7K	1/10W(TC)
R178	NRSA02J-393	MGR	39K	1/10W(TC)
R179	NRSA02J-273	MGR	27K	1/10W(TC)
R180	NRSA02J-271	MGR	270	1/10W(TC)
R181	NRSA02J-562	MGR	5.6K	1/10W(TC)
R183	NRSA02J-122	MGR	1.2K	1/10W(TC)
R186	NRVA02D-103	MFR	10K	1/10W(TC)
R187	NRVA02D-103	MFR	10K	1/10W(TC)
R188	NRSA02J-102	MGR	1.0K	1/10W
R191	NRVA02D-103	MFR	10K	1/10W
R192	NRVA02D-272	MFR	2.7K	1/10W
R193	NRSA02J-224	MGR	220K	1/10W
R194	NRSA02J-392	MGR	3.9K	1/10W
R195	NRVA02D-103	MFR	10K	1/10W
R196	NRVA02D-272	MFR	2.7K	1/10W
R197	NRSA02J-224	MGR	220K	1/10W

Symbol No.	Part No.	Part Name	Description
R198	NRSA02J-392	MGR	3.9K 1/10W
R199	NRVA02D-103	MFR	10K 1/10W
R200	NRVA02D-272	MFR	2.7K 1/10W
R201	NRSA02J-224	MGR	220K 1/10W
R202	NRSA02J-392	MGR	3.9K 1/10W
R203	NRSA02J-102	MGR	1.0K 1/10W
R204	NRSA02J-151	MGR	150 1/10W
R205	NRSA02J-333	MGR	33K 1/10W
R206	NRSA02J-104	MGR	100K 1/10W
R207	NRSA02J-102	MGR	1.0K 1/10W
R208	NRSA02J-102	MGR	1.0K 1/10W
R209	NRSA02J-151	MGR	150 1/10W
R210	NRSA02J-333	MGR	33K 1/10W
R211	NRSA02J-104	MGR	100K 1/10W
R212	NRSA02J-102	MGR	1.0K 1/10W
R213	NRSA02J-102	MGR	1.0K 1/10W
R214	NRSA02J-151	MGR	150 1/10W
R215	NRSA02J-333	MGR	33K 1/10W
R216	NRSA02J-104	MGR	100K 1/10W
R217	NRSA02J-102	MGR	1.0K 1/10W
R218	NRSA02J-122	MGR	1.2K 1/10W
R219	NRSA02J-102	MGR	1.0K 1/10W
R220	NRSA02J-821	MGR	820 1/10W
R221	NRSA02J-101	MGR	100 1/10W
R222	NRSA02J-391	MGR	390 1/10W
R223	NRSA02J-471	MGR	470 1/10W
R224	NRSA02J-471	MGR	470 1/10W
R225	NRSA02J-122	MGR	1.2K 1/10W
R226	NRSA02J-102	MGR	1.0K 1/10W
R227	NRSA02J-392	MGR	3.9K 1/10W
R228	NRSA02J-472	MGR	4.7K 1/10W
R229	NRSA02J-101	MGR	100 1/10W
R230	NRSA02J-102	MGR	1.0K 1/10W
R231	NRSA02J-222	MGR	2.2K 1/10W
R232	NRSA02J-101	MGR	100 1/10W
R233	NRSA02J-472	MGR	4.7K 1/10W
R234	NRSA02J-101	MGR	100 1/10W
R235	NRSA02J-562	MGR	5.6K 1/10W
R238	NRSA02J-332	MGR	3.3K 1/10W
R239	NRSA02J-392	MGR	3.9K 1/10W(TC)
R240	NRSA02J-123	MGR	12K 1/10W
R241	NRSA02J-472	MGR	4.7K 1/10W
R242	NRSA02J-0R0	MGR	0 1/10W
R244	NRSA02J-152	MGR	1.5K 1/10W
R245	NRSA02J-332	MGR	3.3K 1/10W
R246	NRSA02J-682	MGR	6.8K 1/10W
R247	NRSA02J-182	MGR	1.8K 1/10W
R248	NRSA02J-152	MGR	1.5K 1/10W
R249	NRSA02J-562	MGR	5.6K 1/10W
R250	NRSA02J-152	MGR	1.5K 1/10W
R251	NRSA02J-222	MGR	2.2K 1/10W
R252	NRSA02J-682	MGR	6.8K 1/10W
R253	NRSA02J-182	MGR	1.8K 1/10W
R254	NRSA02J-182	MGR	1.8K 1/10W
R255	NRSA02J-562	MGR	5.6K 1/10W
R256	NRSA02J-105	MGR	1.0M 1/10W
R257	NRSA02J-223	MGR	22K 1/10W
R259	NRSA02J-105	MGR	1.0M 1/10W
R260	NRSA02J-223	MGR	22K 1/10W

Symbol No.	Part No.	Part Name	Description
R261	NRSA02J-561	MGR	560 1/10W
R262	NRSA02J-223	MGR	22K 1/10W
R263	NRSA02J-123	MGR	12K 1/10W
R264	NRSA02J-181	MGR	180 1/10W
R265	NRSA02J-562	MGR	5.6K 1/10W
R266	NRSA02J-153	MGR	15K 1/10W
R267	NRSA02J-102	MGR	1.0K 1/10W
R268	NRSA02J-102	MGR	1.0K 1/10W
R269	NRVA02D-272	MFR	2.7K 1/10W
R270	NRSA02J-821	MGR	820 1/10W
R271	NRSA02J-122	MGR	1.2K 1/10W
R272	NRSA02J-562	MGR	5.6K 1/10W(TC)
R273	NRSA02J-152	MGR	1.5K 1/10W
R274	NRSA02J-123	MGR	12K 1/10W
R275	NRSA02J-333	MGR	33K 1/10W
R276	NRSA02J-183	MGR	18K 1/10W
R277	NRVA02D-103	MFR	10K 1/10W
R278	NRSA02J-223	MGR	22K 1/10W
R279	NRSA02J-102	MGR	1.0K 1/10W
R283	NRSA02J-273	MGR	27K 1/10W
R284	NRSA02J-153	MGR	15K 1/10W
R285	NRSA02J-273	MGR	27K 1/10W
R286	NRSA02J-102	MGR	1.0K 1/10W
R287	NRSA02J-102	MGR	1.0K 1/10W
R288	NRSA02J-561	MGR	560 1/10W
R289	NRSA02J-102	MGR	1.0K 1/10W
R290	NRSA02J-122	MGR	1.2K 1/10W
R291	NRSA02J-223	MGR	22K 1/10W
R292	NRSA02J-123	MGR	12K 1/10W
R293	NRSA02J-222	MGR	2.2K 1/10W
R294	NRSA02J-153	MGR	15K 1/10W
R295	NRSA02J-681	MGR	680 1/10W
R297	NRSA02J-102	MGR	1.0K 1/10W
R298	NRSA02J-152	MGR	1.5K 1/10W
R299	NRSA02J-183	MGR	18K 1/10W
R300	NRVA02D-103	MFR	10K 1/10W
R301	NRVA02D-272	MFR	2.7K 1/10W
R302	NRSA02J-392	MGR	3.9K 1/ 10W(X1)
R303	NRSA02J-680	MGR	68 1/ 10W(X1)
R304	NRSA02J-680	MGR	68 1/10W
R305	NRSA02J-750	MGR	75 1/10W
R306	NRSA02J-391	MGR	390 1/10W
R307	NRVA02D-272	MFR	2.7K 1/10W
R308	NRSA02J-153	MGR	15K 1/10W
R310	NRSA02J-223	MGR	22K 1/10W
R311	NRSA02J-561	MGR	560 1/10W
R312	NRSA02J-471	MGR	470 1/10W
R313	NRSA02J-392	MGR	3.9K 1/10W
R314	NRSA02J-220	MGR	22 1/10W
R315	NRSA02J-220	MGR	22 1/10W
R316	NRSA02J-222	MGR	2.2K 1/10W
R317	NRSA02J-0R0	MGR	0 1/10W
R318	NRSA02J-0R0	MGR	0 1/10W
R320	NRSA02J-223	MGR	22K 1/10W
R321	NRVA02D-103	MFR	10K 1/10W
R322	NRSA02J-680	MGR	68 1/10W
R323	NRSA02J-123	MGR	12K 1/10W
R324	NRSA02J-273	MGR	27K 1/10W
R325	NRSA02J-153	MGR	15K 1/10W

(SECC)

Symbol No.	Part No.	Part Name	Description	
R326	NRSA02J-102	MGR	1.0K	1/10W
R327	NRSA02J-821	MGR	820	1/10W
R328	NRSA02J-102	MGR	1.0K	1/10W
R329	NRSA02J-102	MGR	1.0K	1/10W
R330	NRSA02J-123	MGR	12K	1/10W
R331	NRSA02J-562	MGR	5.6K	1/10W
R332	NRSA02J-562	MGR	5.6K	1/10W
R333	NRSA02J-223	MGR	22K	1/10W
R334	NRVA02D-103	MFR	10K	1/10W
R335	NRVA02D-103	MFR	10K	1/10W
R336	NRSA02J-333	MGR	33K	1/10W
R337	NRSA02J-152	MGR	1.5K	1/10W
R338	NRSA02J-221	MGR	220	1/10W
R339	NRSA02J-471	MGR	470	1/10W
R340	NRSA02J-471	MGR	470	1/10W
R341	NRSA02J-680	MGR	68	1/10W(TC)
R342	NRSA02J-392	MGR	3.9K	1/10W(TC)
R343	NRSA02J-562	MGR	5.6K	1/10W
R344	NRSA02J-392	MGR	3.9K	1/10W
R345	NRSA02J-392	MGR	3.9K	1/10W
R346	NRVA02D-103	MFR	10K	1/10W
VR1	NVP1501-103	V.RESISTOR	10K	G GAIN
VR2	NVP1501-202	V.RESISTOR	2K	NOISE SLICE
VR5	NVP1501-501	V.RESISTOR	500	SC LOCK(TC)
VR6	NVP1501-202	V.RESISTOR	2K	COMP GAIN
VR7	NVP1501-102	V.RESISTOR	1K	VTR Y
VR8	NVP1501-502	V.RESISTOR	5K	SYNC LEVEL
VR9	NVP1501-102	V.RESISTOR	1K	R-Y GAIN
VR10	NVP1501-501	V.RESISTOR	500	C MASTER
VR11	NVP1501-501	V.RESISTOR	500	VTR C
VR12	NVP1501-501	V.RESISTOR	500	QUAD
VR13	NVP1501-102	V.RESISTOR	1K	B-Y C.BAL
VR14	NVP1501-102	V.RESISTOR	1K	R-Y C.BAL
VR15	NVP1501-102	V.RESISTOR	1K	R-Y C.BAL
VR16	NVP1501-103	V.RESISTOR	10K	BURST PHASE
VR17	NVP1501-502	V.RESISTOR	5K	BURST LEVEL
C1	NEA11AM-336	E CAP	33	10V
C2	NEA11AM-336	E CAP	33	10V
C3	NEA11AM-336	E CAP	33	10V
C4	NEA11AM-336	E CAP	33	10V
C5	NEA11AM-336	E CAP	33	10V
C6	NEA11AM-336	E CAP	33	10V
C7	NCT03CH-820	C CAP	82P	50V
C8	NEA11AM-336	E CAP	33	10V
C9	NEA11AM-336	E CAP	33	10V
C10	NEF11AM-475	T CAP	4.7	10V
C11	NEF11AM-475	T CAP	4.7	10V
C12	NEF11EM-474	T CAP	0.47	25V
C13	NEF11EM-474	T CAP	0.47	25V
C14	NCF21EZ-104	C CAP	0.10	25V
C15	NCF21EZ-104	C CAP	0.10	25V
C16	NEF11CM-105	T CAP	1.0	16V
C17	NEF11AM-475	T CAP	4.7	10V
C18	NEF11AM-475	T CAP	4.7	10V
C19	NEF11AM-475	T CAP	4.7	10V
C20	NCF21EZ-104	C CAP	0.10	25V

Symbol No.	Part No.	Part Name	Description	
C21	NCF21EZ-104	C CAP	0.10	25V
C22	NCF21HZ-103	C CAP	0.010	50V
C23	NCF21EZ-104	C CAP	0.10	25V
C24	NEF11CM-105	T CAP	1.0	16V
C25	NEF11CM-105	T CAP	1.0	16V
C26	NCT03CH-330	C CAP	33P	50V
C27	NEA11AM-336	E CAP	33	10V
C28	NCT03CH-121	C CAP	120P	50V
C30	NEA11AM-336	E CAP	33	10V
C31	NEA11AM-336	E CAP	33	10V
C32	NEA11AM-336	E CAP	33	10V
C33	NEF11AM-475	T CAP	4.7	10V
C34	NEF11AM-475	T CAP	4.7	10V
C35	NEF11EM-474	T CAP	0.47	25V
C36	NEF11EM-474	T CAP	0.47	25V
C37	NCF21EZ-104	C CAP	0.10	25V
C38	NCF21EZ-104	C CAP	0.10	25V
C39	NEF11CM-105	T CAP	1.0	16V
C40	NEF11AM-475	T CAP	4.7	10V
C41	NEF11AM-475	T CAP	4.7	10V
C42	NEF11AM-475	T CAP	4.7	10V
C43	NCF21EZ-104	C CAP	0.10	25V
C44	NCF21EZ-104	C CAP	0.10	25V
C45	NCF21HZ-103	C CAP	0.010	50V
C46	NCF21EZ-104	C CAP	0.10	25V
C47	NEF11CM-105	T CAP	1.0	16V
C48	NEF11CM-105	T CAP	1.0	16V
C49	NCT03CH-330	C CAP	33P	50V
C50	NEA11AM-336	E CAP	33	10V
C51	NEA11AM-336	E CAP	33	10V
C52	NEA11AM-336	E CAP	33	10V
C53	NEA11AM-336	E CAP	33	10V
C54	NEA11AM-336	E CAP	33	10V
C55	NEA11EM-106	E CAP	10	25V
C57	NCF21EZ-104	C CAP	0.10	25V
C58	NEF11CM-106	T CAP	10	16V
C59	NEA11EM-106	E CAP	10	25V
C60	NEA11EM-106	E CAP	10	25V
C61	NEA11AM-336	E CAP	33	10V
C62	NEF11CM-106	T CAP	10	16V
C64	NEA11AM-336	E CAP	33	10V
C66	NEF11CM-106	T CAP	10	16V
C67	NEA11AM-336	E CAP	33	10V
C68	NCF21EZ-104	C CAP	0.10	25V
C69	NCF21EZ-104	C CAP	0.10	25V
C71	NEA11AM-336	E CAP	33	10V
C72	NEA11AM-336	E CAP	33	10V
C73	NEA11AM-336	E CAP	33	10V
C74	NEA11AM-336	E CAP	33	10V
C75	NCF21EZ-104	C CAP	0.10	25V
C76	NCF21EZ-104	C CAP	0.10	25V
C77	NCT03CH-8R0	C CAP	8.0P	50V
C78	NCT03CH-180	C CAP	18P	50V
C79	NCT03CH-101	C CAP	100P	50V
C80	NCF21EZ-104	C CAP	0.10	25V
C81	NEF11AM-475	T CAP	4.7	10V
C82	NCT03CH-470	C CAP	47P	50V
C83	NCF21EZ-104	C CAP	0.10	25V
C84	NCF21EZ-104	C CAP	0.10	25V
C85	NEF11CM-106	T CAP	10	16V

Symbol No.	Part No.	Part Name	Description
C86	NEF11AM-225	T CAP	2.2 10V
C87	NEF11CM-106	T CAP	10 16V
C88	NCF21EZ-104	C CAP	0.10 25V
C89	NCF21EZ-104	C CAP	0.10 25V
C90	NCF21EZ-104	C CAP	0.10 25V
C91	NCF21EZ-104	C CAP	0.10 25V
C92	NCT03CH-561	C CAP	560P 50V
C94	NCT03CH-390	C CAP	39P 50V
C95	NCF21EZ-104	C CAP	0.10 25V
C96	NEA11EM-106	E CAP	10 25V
C97	NCF21EZ-104	C CAP	0.10 25V
C98	NEA11AM-336	E CAP	33 10V(TC)
C99	NCF21EZ-104	C CAP	0.10 25V
C100	NEF11CM-105	T CAP	1.0 16V
C101	NCT03CH-151	C CAP	150P 50V
C102	NCT03CH-180	C CAP	18P 50V
C104	NEF11AM-475	T CAP	4.7 10V
C105	NEF11VM-104	T CAP	0.10 35V
C107	NEA11EM-106	E CAP	10 25V
C108	NEA11AM-336	E CAP	33 10V(TC)
C110	NEF10GM-106	T CAP	10 4V(TC)
C111	NEA11AM-336	E CAP	33 10V(TC)
C112	NEA11AM-336	E CAP	33 10V(TC)
C113	NEA11AM-336	E CAP	33 10V(TC)
C114	NCF21EZ-104	C CAP	0.10 25V(TC)
C115	NCT03CH-220	C CAP	22P 50V(TC)
C116	NCT03CH-270	C CAP	27P 50V(TC)
C117	NCF21EZ-104	C CAP	0.10 25V(TC)
C118	NCT03CH-270	C CAP	27P 50V(TC)
C119	NCF21EZ-104	C CAP	0.10 25V(TC)
C120	NEF11AM-475	T CAP	4.7 10V(TC)
C121	NEF11CM-105	T CAP	1.0 16V(TC)
C122	NEF11CM-106	T CAP	10 16V(TC)
C123	NCF21EZ-104	C CAP	0.10 25V(TC)
C124	NEA11AM-336	E CAP	33 10V(TC)
C129	NCF21HZ-103	C CAP	0.010 50V(TC)
C130	NCT03CH-101	C CAP	100P 50V(TC)
C131	NCF21EZ-104	C CAP	0.10 25V(TC)
C132	NCT03CH-101	C CAP	100P 50V(TC)
C133	NCT03CH-101	C CAP	100P 50V(TC)
C134	NCF21EZ-104	C CAP	0.10 25V(TC)
C135	NEF11CM-105	T CAP	1.0 16V(TC)
C136	NEA11EM-106	E CAP	10 25V(TC)
C137	NEF11CM-106	T CAP	10 16V(TC)
C138	NEF11CM-684	T CAP	0.68 16V(TC)
C139	NEF11CM-106	T CAP	10 16V(TC)
C140	NCF21EZ-104	C CAP	0.10 25V(TC)
C141	NEF11CM-106	T CAP	10 16V(TC)
C142	NCF21EZ-104	C CAP	0.10 25V(TC)
C144	NEA11AM-336	E CAP	33 10V(TC)
C145	NCF21EZ-104	C CAP	0.10 25V
C146	NCT03CH-101	C CAP	100P 50V(TC)
C147	NEF11AM-475	T CAP	4.7 10V
C149	NCT03CH-390	C CAP	39P 50V
C150	NEA11AM-336	E CAP	33 10V(TC)
C151	NEA11AM-336	E CAP	33 10V
C152	NEA11AM-336	E CAP	33 10V
C153	NEA11AM-336	E CAP	33 10V
C154	NCF21EZ-104	C CAP	0.10 25V
C155	NCF21EZ-104	C CAP	0.10 25V
C156	NCT03CH-680	C CAP	68P 50V
C157	NCT03CH-150	C CAP	15P 50V
C158	NCT03CH-680	C CAP	68P 50V
C159	NCT03CH-150	C CAP	15P 50V
C160	NEA11EM-106	E CAP	10 25V
C161	NEA11AM-336	E CAP	33 10V
C162	NEA11AM-336	E CAP	33 10V
C163	NEA11AM-336	E CAP	33 10V
C164	NEA11AM-336	E CAP	33 10V
C165	NEA11AM-336	E CAP	33 10V
C166	NEA11AM-336	E CAP	33 10V
C167	NEA11AM-336	E CAP	33 10V
C168	NEA11AM-336	E CAP	33 10V
C169	NEA11AM-336	E CAP	33 10V
C170	NEA11AM-336	E CAP	33 10V
C171	NEA11AM-336	E CAP	33 10V
C172	NEA11EM-106	E CAP	10 25V
C173	NEA11AM-336	E CAP	33 10V
C174	NEA11AM-336	E CAP	33 10V
C175	NEA11AM-336	E CAP	33 10V
C176	NEA11AM-336	E CAP	33 10V
C177	NEA11AM-336	E CAP	33 10V
C178	NCF21HZ-103	C CAP	0.010 50V
C179	NCF21HZ-103	C CAP	0.010 50V
C181	NCF21EZ-104	C CAP	0.10 25V
C182	NCF21HZ-103	C CAP	0.010 50V
C185	NCF21EZ-104	C CAP	0.10 25V
C186	NEF11CM-684	T CAP	0.68 16V
C187	NEF11CM-684	T CAP	0.68 16V
C188	NCT03CH-390	C CAP	39P 50V
C189	NCT03CH-330	C CAP	33P 50V
C190	NCT03CH-180	C CAP	18P 50V
C191	NCT03CH-121	C CAP	120P 50V
C192	NEA11EM-106	E CAP	10 25V
C193	NEA11AM-336	E CAP	33 10V
C194	NEA11AM-336	E CAP	33 10V
C195	NEA11AM-336	E CAP	33 10V
C196	NEA10GM-227	E CAP	220 4V
C197	NEA11EM-106	E CAP	10 25V
C198	NEA11AM-336	E CAP	33 10V
C199	NEA11AM-336	E CAP	33 10V
C200	NEA11AM-336	E CAP	33 10V
C201	NCT03CH-220	C CAP	22P 50V
C202	NCT03CH-121	C CAP	120P 50V
C203	NEA11AM-336	E CAP	33 10V
C204	NEA11AM-336	E CAP	33 10V
C205	NCF21EZ-104	C CAP	0.10 25V
C206	NCT03CH-101	C CAP	100P 50V
C207	NEA11AM-336	E CAP	33 10V
C208	NEA11AM-336	E CAP	33 10V
C209	NEA11AM-336	E CAP	33 10V
C210	NEA11AM-336	E CAP	33 10V
C211	NEA11AM-336	E CAP	33 10V
C212	NCF21EZ-104	C CAP	0.10 25V
C213	NCT03CH-330	C CAP	33P 50V
C214	NEA11EM-106	E CAP	10 25V
C215	NCT03CH-560	C CAP	56P 50V
C216	NCT03CH-560	C CAP	56P 50V
C217	NCT03CH-560	C CAP	56P 50V
C218	NEA11AM-336	E CAP	33 10V

(SECC)

Symbol No.	Part No.	Part Name	Description
C219	NEA11AM-336	E CAP	33 10V
C220	NEA11AM-336	E CAP	33 10V
C221	NEA11AM-336	E CAP	33 10V(TC)
C222	NEF11CM-105	T CAP	1.0 16V
C223	NCB21HK-332	C CAP	3300P 50V
C224	NCT03CH-561	C CAP	560P 50V
C225	NCT03CH-121	C CAP	120P 50V
VC1	NAT3112-200RZ	TRIM.CAP	20P SC ADJ
VC2	NAT3112-400	TRIM.CAP	40P H ADJ
L1	SSV1330-150	COIL	15μ
L2	SSV1330-150	COIL	15μ
L3	SSV1330-150	COIL	15μ
L5	SCV1950-5R6	PEAKING COIL	5.6μ
L6	SCV1950-5R6	PEAKING COIL	5.6μ
L7	SSV1330-150	COIL	15μ
L8	SSV1330-150	COIL	15μ
L11	SCV1950-220	PEAKING COIL	22μ (TC)
L12	SCV1950-120	PEAKING COIL	12μ (TC)
L13	SSV1330-150	COIL	15μ
L14	SSV1330-150	COIL	15μ
L15	SSV1330-150	COIL	15μ
L16	SSV1330-150	COIL	15μ
L17	SCV1950-100	PEAKING COIL	10μ
L18	SCV1950-100	PEAKING COIL	10μ
L19	SCV1950-390	PEAKING COIL	39μ
L20	SCV1950-220	PEAKING COIL	22μ
DL1	SCV1761-001	DELAY LINE	65nsec
DL2	SCV1761-001	DELAY LINE	65nsec
DL3	SCV1253-001	DELAY LINE	140nsec
DL4	SCV1253-001	DELAY LINE	140nsec
DL5	SCV1569-001	DELAY LINE	120nsec
DL6	SCV1850-001	DELAY LINE	300nsec
X1	SCV0348-002	CRYSTAL	17.73447MHz
X2	SCV1316-002	CRYSTAL	27MHz
X3	SCV1762-001	CRYSTAL	21.328125MHz
CN9	SCV1848-030	CONNECTOR	30 pin
CN12	SCV1770-004	CONNECTOR	4 pin
CN19	SSV1321-020	CONNECTOR	20 pin
CN20	SSV1321-020	CONNECTOR	20 pin
CN35	SCV1770-006	CONNECTOR	6 pin
CN39	SCV1770-007	CONNECTOR	7 pin (TC)
CN45	SCV1770-005	CONNECTOR	5 pin (TC)
T1	SCV1801-001Z	TRANS	SC TRANS
	CBM1 CBMC2257-02-00A CONTOUR CBM		
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q2	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA

Symbol No.	Part No.	Part Name	Description
Q4	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q5	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q6	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
D1	MA152A	DIODE	MATSUSHITA
R1	NRSA02J-272	MGR	2.7K 1/10W
R2	NRSA02J-182	MGR	1.8K 1/10W
R3	NRSA02J-272	MGR	2.7K 1/10W
R4	NRSA02J-681	MGR	680 1/10W
R5	NRSA02J-222	MGR	2.2K 1/10W
R6	NRSA02J-821	MGR	820 1/10W
R7	NRSA02J-821	MGR	820 1/10W
R8	NRSA02J-271	MGR	270 1/10W
R11	NRSA02J-333	MGR	33K 1/10W
R12	NRSA02J-153	MGR	15K 1/10W
R13	NRSA02J-153	MGR	15K 1/10W
R14	NRSA02J-102	MGR	1.0K 1/10W
R15	NRSA02J-222	MGR	2.2K 1/10W
R16	NRSA02J-332	MGR	3.3K 1/10W
R17	NRSA02J-473	MGR	47K 1/10W
R18	NRSA02J-393	MGR	39K 1/10W
R19	NRSA02J-472	MGR	4.7K 1/10W
R20	NRSA02J-392	MGR	3.9K 1/10W
R21	NRSA02J-392	MGR	3.9K 1/10W
R22	NRSA02J-682	MGR	6.8K 1/10W
R23	NRSA02J-562	MGR	5.6K 1/10W
R24	NRSA02J-222	MGR	2.2K 1/10W
R25	NRSA02J-272	MGR	2.7K 1/10W
VR1	NVP1501-202	V.RESISTOR	2K H.LEVEL
VR2	NVP1501-502	V.RESISTOR	5K V.BAL
VR3	NVP1501-202	V.RESISTOR	2K V.LEVEL
C1	NCF21EZ-104	C CAP	0.10 25V
C2	NEF11CM-106	T CAP	10 16V
C3	NCT03CH-560	C CAP	56P 50V
C4	NCT03CH-330	C CAP	33P 50V
L1	SCV1488-121	PEAKING COIL	120μ
	CBM2 CBMC2257-03-00A ZEBRA CBM		
IC1	LM319M	I.C.(M)	
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q2	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q4	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
R1	NRSA02J-102	MGR	1.0K 1/10W
R2	NRSA02J-122	MGR	1.2K 1/10W
R3	NRSA02J-391	MGR	390 1/10W

Symbol No.	Part No.	Part Name	Description
R4	NRSA02J-101	MGR	100 1/10W
R5	NRSA02J-152	MGR	1.5K 1/10W
R7	NRSA02J-104	MGR	100K 1/10W
R8	NRSA02J-103	MGR	10K 1/10W
R9	NRSA02J-822	MGR	8.2K 1/10W
R10	NRSA02J-562	MGR	5.6K 1/10W
R11	NRSA02J-822	MGR	8.2K 1/10W
R12	NRSA02J-332	MGR	3.3K 1/10W
R13	NRSA02J-222	MGR	2.2K 1/10W
R14	NRSA02J-822	MGR	8.2K 1/10W
R15	NRSA02J-121	MGR	120 1/10W
VR1	NVP1501-503	V.RESISTOR	20K ZEBRA SET
C1	NCF21HZ-103	C CAP	0.010 50V
C2	NCF21EZ-104	C CAP	0.10 25V
C3	NCF21EZ-104	C CAP	0.10 25V
C4	NEF10JM-226	T CAP	22 6.3V

7.9 RF1 board assembly 59
(GY-X1TC only)

59☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	MC74HC74AF	I.C.(M)	MOTOROLA
IC2	MC74HC04AF	I.C.(M)	MOTOROLA
IC4	EPS448PC-20(L02	I.C.(M)	JVC
Q5	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q6	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
D2	MA152A	DIODE	MATSUSHITA
D3	MA152WK	DIODE	MATSUSHITA
R1	NRSA02J-471	MGR	470 1/10W
R2	NRSA02J-472	MGR	4.7K 1/10W
R3	NRSA02J-474	MGR	470K 1/10W
R4	NRSA02J-104	MGR	100K 1/10W
R5	NRSA02J-223	MGR	22K 1/10W
R6	NRSA02J-223	MGR	22K 1/10W
R7	NRSA02J-223	MGR	22K 1/10W
R20	NRSA02J-223	MGR	22K 1/10W
R29	NRSA02J-103	MGR	10K 1/10W
R30	NRSA02J-103	MGR	10K 1/10W
R31	NRSA02J-472	MGR	4.7K 1/10W
R32	NRSA02J-472	MGR	4.7K 1/10W
R33	NRSA02J-332	MGR	3.3K 1/10W
C1	NEA11AM-336	E CAP	33 10V
C2	NCF21EZ-104	C CAP	0.10 25V
C3	NCF21EZ-104	C CAP	0.10 25V
C4	NCF21HZ-103	C CAP	0.010 50V
C5	NEA11AM-336	E CAP	33 10V
C6	NCF21EZ-104	C CAP	0.10 25V
C7	NCF21EZ-104	C CAP	0.10 25V
C8	NEA11AM-336	E CAP	33 10V
C24	NCF21EZ-104	C CAP	0.10 25V
C25	NEF11CM-105	T CAP	1.0 16V
L1	SSV1330-150	COIL	15μ
X1	SCV1865-001	CRYSTAL	13.3MHz
S1	SCV1919-004	DIP SWITCH	REF/A/B/C
CN39	SCV1770-007	CONNECTOR	7 pin
CN43	SCV1814-008	CONNECTOR	8 pin
CN44	SCV1814-008	CONNECTOR	8 pin

7.10 RF2 board assembly 60
(GY-X1TC only)

60□□□□□□

Symbol No.	Part No.	Part Name	Description
IC5	MC14052BF	I.C.(M)	MOTOROLA
IC6	MC74HC00AF	I.C.(M)	MOTOROLA
IC7	MC74HC393F	I.C.(M)	MOTOROLA
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q2	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q4	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
R8	NRSA02J-101	MGR	100 1/10W
R9	NRSA02J-223	MGR	22K 1/10W
R10	NRSA02J-223	MGR	22K 1/10W
R11	NRSA02J-101	MGR	100 1/10W
R12	NRSA02J-223	MGR	22K 1/10W
R13	NRSA02J-223	MGR	22K 1/10W
R14	NRSA02J-104	MGR	100K 1/10W
R15	NRSA02J-104	MGR	100K 1/10W
R16	NRSA02J-104	MGR	100K 1/10W
R17	NRSA02J-104	MGR	100K 1/10W
R18	NRSA02J-682	MGR	6.8K 1/10W
R19	NRSA02J-332	MGR	3.3K 1/10W
R21	NRSA02J-223	MGR	22K 1/10W
R22	NRSA02J-223	MGR	22K 1/10W
R23	NRSA02J-102	MGR	1.0K 1/10W
R24	NRSA02J-223	MGR	22K 1/10W
R25	NRSA02J-223	MGR	22K 1/10W
R26	NRSA02J-152	MGR	1.5K 1/10W
R27	NRSA02J-273	MGR	27K 1/10W
R28	NRSA02J-273	MGR	27K 1/10W
VR1	NVP1500-102	V.RESISTOR	1K fb LEVEL
VR2	NVP1500-102	V.RESISTOR	1K fa LEVEL
C9	NCF21EZ-104	C CAP	0.10 25V
C10	NCF21EZ-104	C CAP	0.10 25V
C11	NCF21EZ-104	C CAP	0.10 25V
C12	NCF21EZ-104	C CAP	0.10 25V
C13	NEA10GM-476	E CAP	47 4V
C14	NCF21EZ-104	C CAP	0.10 25V
C15	NCF21EZ-104	C CAP	0.10 25V
C16	NCF21EZ-104	C CAP	0.10 25V
C17	NCF21EZ-104	C CAP	0.10 25V
C18	NCF21HZ-103	C CAP	0.010 50V
C19	NEA11AM-336	E CAP	33 10V
C20	NCF21HZ-103	C CAP	0.010 50V
C21	NEF11CM-105	T CAP	1.0 16V
C22	NCTO3CH-470	C CAP	47P 50V
C23	NCTO3CH-820	C CAP	82P 50V
CN43	SCV1934-08	CONNECTOR	8pin
CN44	SCV1934-08	CONNECTOR	8 pin

7.11 CP board assembly 61

61□□□□□□

Symbol No.	Part No.	Part Name	Description
IC1	MB89T715PF	I.C.(M)	FUJITU
IC2	MC74HC04AF	I.C.(M)	MOTOROLA
IC3	MC74HC04AF	I.C.(M)	MOTOROLA
IC4	MC74HC04AF	I.C.(M)	MOTOROLA
IC5	MC74HC00AF	I.C.(M)	MOTOROLA
IC6	MC74HC00AF	I.C.(M)	MOTOROLA
IC7	TC50H001F	I.C.(M)	TOSHIBA
IC9	PST529C-2	I.C.(M)	MITSUMI
IC10	MC74HC138AF	I.C.(M)	MOTOROLA
IC11	MC74HC138AF	I.C.(M)	MOTOROLA
IC12	MC74HC139AF	I.C.(M)	MOTOROLA
IC13	MC74HC373F	I.C.(M)	MOTOROLA
IC14	CXK5816M-15	I.C.(M)	SONY
IC15	PLSC1039	I.C.(M)	FUJITSU
IC17	RC4560MDT2	I.C.(M)	RAYTHEON
IC19	TC50H001F	I.C.(M)	TOSHIBA
IC20	RC2068MD	I.C.(M)	RAYTHEON
IC21	MC14094BF	I.C.(M)	MOTOROLA
IC22	UPD7756G-533	I.C.(M)	NEC
IC23	S-3520AF	I.C.(M)	SEIKO
IC24	MB89012-109	I.C.(M)	FUJITSU
IC25	MB89012-109	I.C.(M)	FUJITSU
IC26	RC2068MD	I.C.(M)	RAYTHEON
IC27	LM386M	I.C.(M)	NATIONAL SEMI
IC28	S-2924RF	I.C.(M)	SEIKO
IC29	TC4S01F	I.C.(M)	TOSHIBA
IC30	MB89251APF	I.C.(M)	FUJITSU
IC31	MC74HC74AF	I.C.(M)	MOTOROLA
IC32	RC062M	I.C.(M)	JRC
IC33	RC062M	I.C.(M)	JRC
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q2	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q3	DTC124EK	TRANSISTOR	ROHM
Q4	DTC124EK	TRANSISTOR	ROHM
Q7	DTC124EK	TRANSISTOR	ROHM
Q8	2SK198(Q.R)	FET	MATSUSHITA
Q9	DTA124EK	TRANSISTOR	ROHM
Q10	2SK198(Q.R)	FET	MATSUSHITA
Q11	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q12	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q13	2SK198(Q.R)	FET	MATSUSHITA
Q14	2SK198(Q.R)	FET	MATSUSHITA
Q15	DTC124EK	TRANSISTOR	ROHM
Q16	2SK198(Q.R)	FET	MATSUSHITA
D1	MA153	DIODE	MATSUSHITA
D2	MA153	DIODE	MATSUSHITA
D3	MA153	DIODE	MATSUSHITA
D4	MA153	DIODE	MATSUSHITA
D5	MA152A	DIODE	MATSUSHITA
D6	MA152A	DIODE	MATSUSHITA
D7	MA153	DIODE	MATSUSHITA
D8	HSM276S	DIODE	
D9	MA152K	DIODE	MATSUSHITA
D10	MA153	DIODE	MATSUSHITA
D11	MA153	DIODE	MATSUSHITA
D12	MA153	DIODE	MATSUSHITA
D13	MA153	DIODE	MATSUSHITA

Symbol No.	Part No.	Part Name	Description
D14	MA153	DIODE	MATSUSHITA
D15	MA152A	DIODE	MATSUSHITA
D16	MA152A	DIODE	MATSUSHITA
R4	NRSA02J-103	MGR	10K 1/10W
R5	NRSA02J-103	MGR	10K 1/10W
R8	NRSA02J-223	MGR	22K 1/10W
R9	NRSA02J-223	MGR	22K 1/10W
R10	NRSA02J-103	MGR	10K 1/10W
R12	NRSA02J-223	MGR	22K 1/10W
R13	NRSA02J-223	MGR	22K 1/10W
R14	NRSA02J-223	MGR	22K 1/10W
R15	NRSA02J-223	MGR	22K 1/10W
R16	NRSA02J-223	MGR	22K 1/10W
R17	NRSA02J-223	MGR	22K 1/10W
R18	NRSA02J-103	MGR	10K 1/10W
R19	NRSA02J-103	MGR	10K 1/10W
R20	NRSA02J-103	MGR	10K 1/10W
R21	NRSA02J-103	MGR	10K 1/10W
R22	NRSA02J-103	MGR	10K 1/10W
R23	NRSA02J-103	MGR	10K 1/10W
R24	NRSA02J-103	MGR	10K 1/10W
R29	NRSA02J-223	MGR	22K 1/10W
R30	NRSA02J-223	MGR	22K 1/10W
R31	NRSA02J-104	MGR	100K 1/10W
R32	NRSA02J-334	MGR	330K 1/10W
R33	NRSA02J-223	MGR	22K 1/10W
R34	NRSA02J-103	MGR	10K 1/10W
R35	NRSA02J-103	MGR	10K 1/10W
R36	NRSA02J-103	MGR	10K 1/10W
R37	NRSA02J-103	MGR	10K 1/10W
R38	NRSA02J-103	MGR	10K 1/10W
R39	NRSA02J-103	MGR	10K 1/10W
R40	NRSA02J-224	MGR	220K 1/10W
R41	NRSA02J-223	MGR	22K 1/10W
R42	NRSA02J-124	MGR	120K 1/10W
R43	NRSA02J-100	MGR	10 1/10W
R44	NRSA02J-473	MGR	47K 1/10W
R45	NRSA02J-562	MGR	5.6K 1/10W
R46	NRSA02J-822	MGR	8.2K 1/10W
R47	NRSA02J-472	MGR	4.7K 1/10W
R48	NRSA02J-183	MGR	18K 1/10W
R49	NRSA02J-393	MGR	39K 1/10W
R50	NRSA02J-561	MGR	560 1/10W
R51	NRSA02J-104	MGR	100K 1/10W
R52	NRSA02J-103	MGR	10K 1/10W
R53	NRSA02J-101	MGR	100 1/10W
R54	NRSA02J-103	MGR	10K 1/10W
R55	NRSA02J-103	MGR	10K 1/10W
R56	NRSA02J-223	MGR	22K 1/10W
R57	NRSA02J-222	MGR	2.2K 1/10W
R58	NRSA02J-103	MGR	10K 1/10W
R59	NRSA02J-222	MGR	2.2K 1/10W
R61	NRSA02J-393	MGR	39K 1/10W
R62	NRSA02J-152	MGR	1.5K 1/10W
R63	NRSA02J-153	MGR	15K 1/10W
R64	NRSA02J-153	MGR	15K 1/10W
R65	NRSA02J-102	MGR	1.0K 1/10W
R66	NRSA02J-153	MGR	15K 1/10W

Symbol No.	Part No.	Part Name	Description
R67	NRSA02J-153	MGR	15K 1/10W
R68	NRSA02J-333	MGR	33K 1/10W
R69	NRSA02J-104	MGR	100K 1/10W
R70	NRSA02J-103	MGR	10K 1/10W
R71	NRSA02J-100	MGR	10 1/10W
R72	NRSA02J-223	MGR	22K 1/10W
R75	NRSA02J-223	MGR	22K 1/10W
R77	NRSA02J-101	MGR	100 1/10W
R78	NRSA02J-101	MGR	100 1/10W
R79	NRSA02J-101	MGR	100 1/10W
R80	NRSA02J-100	MGR	10 1/10W
R81	NRSA02J-101	MGR	100 1/10W
R82	NRSA02J-101	MGR	100 1/10W
R83	NRSA02J-101	MGR	100 1/10W
R84	NRSA02J-101	MGR	100 1/10W
R85	NRSA02J-222	MGR	2.2K 1/10W
R86	NRSA02J-391	MGR	390 1/10W
R87	NRSA02J-104	MGR	100K 1/10W
R88	NRSA02J-224	MGR	220K 1/10W
R89	NRSA02J-123	MGR	12K 1/10W
R90	NRSA02J-103	MGR	10K 1/10W
R91	NRSA02J-103	MGR	10K 1/10W
R92	NRSA02J-222	MGR	2.2K 1/10W
R93	NRSA02J-223	MGR	22K 1/10W
R94	NRSA02J-222	MGR	2.2K 1/10W
R95	NRSA02J-822	MGR	8.2K 1/10W
R99	NRSA02J-103	MGR	10K 1/10W
R100	NRSA02J-153	MGR	15K 1/10W
R101	NRSA02J-274	MGR	270K 1/10W
R102	NRSA02J-104	MGR	100K 1/10W
R103	NRSA02J-100	MGR	10 1/10W
R104	NRSA02J-103	MGR	10K 1/10W
R105	NRSA02J-104	MGR	100K 1/10W
R106	NRSA02J-274	MGR	270K 1/10W
R107	NRSA02J-103	MGR	10K 1/10W
R108	NRSA02J-103	MGR	10K 1/10W
R109	NRSA02J-103	MGR	10K 1/10W
R110	NRSA02J-103	MGR	10K 1/10W
R111	NRSA02J-100	MGR	10 1/10W
R112	NRSA02J-274	MGR	270K 1/10W
R113	NRSA02J-104	MGR	100K 1/10W
R114	NRSA02J-274	MGR	270K 1/10W
R115	NRSA02J-101	MGR	100 1/10W
R116	NRSA02J-472	MGR	4.7K 1/10W
R117	NRSA02J-101	MGR	100 1/10W
R118	NRSA02J-101	MGR	100 1/10W
R119	NRSA02J-101	MGR	100 1/10W
R120	NRSA02J-101	MGR	100 1/10W
R121	NRSA02J-101	MGR	100 1/10W
R122	NRSA02J-101	MGR	100 1/10W
R123	NRSA02J-101	MGR	100 1/10W
R124	NRSA02J-472	MGR	4.7K 1/10W
R125	NRSA02J-472	MGR	4.7K 1/10W
R126	NRSA02J-471	MGR	470 1/10W
VR1	SCV1758-202	TRIM.RESISTOR	2K AUD.MONI.LEV
VR2	NVP1501-204	V.RESISTOR	200K AUDIO LEV.
VR3	NVP1501-502	V.RESISTOR	5K NAM KNEE
VR4	NVP1501-103	V.RESISTOR	10K NAM LEVEL

Symbol No.	Part No.	Part Name	Description	
C1	NEA11EM-106	E CAP	10	25V
C2	NCF21EZ-104	C CAP	0.10	25V
C3	NEA11EM-106	E CAP	10	25V
C4	NEA11EM-106	E CAP	10	25V
C6	NEA11CM-476	E CAP	47	16V
C7	NCF21EZ-104	C CAP	0.10	25V
C8	NCB21HK-222	C CAP	2200P	50V
C9	NCF21EZ-104	C CAP	0.10	25V
C10	NCF21EZ-104	C CAP	0.10	25V
C11	NCF21EZ-104	C CAP	0.10	25V
C12	NCF21EZ-104	C CAP	0.10	25V
C13	NCF21EZ-104	C CAP	0.10	25V
C16	NEA11CM-476	E CAP	47	16V
C17	NEA11EM-106	E CAP	10	25V
C19	NEA11CM-476	E CAP	47	16V
C20	NEA11EM-106	E CAP	10	25V
C21	NEF11AM-225	T CAP	2.2	10V
C22	NCF21EZ-104	C CAP	0.10	25V
C23	NCF21EZ-104	C CAP	0.10	25V
C24	NCF21EZ-104	C CAP	0.10	25V
C25	NCF21EZ-104	C CAP	0.10	25V
C26	NCF21EZ-104	C CAP	0.10	25V
C27	NCF21EZ-104	C CAP	0.10	25V
C28	NCF21EZ-104	C CAP	0.10	25V
C30	NEA11CM-476	E CAP	47	16V
C31	NEA11CM-476	E CAP	47	16V
C32	NEA11EM-106	E CAP	10	25V
C33	NEA11CM-476	E CAP	47	16V
C34	NEA11CM-476	E CAP	47	16V
C35	NCT03CH-220	C CAP	22P	50V
C36	NCT03CH-220	C CAP	22P	50V
C37	NCF21EZ-104	C CAP	0.10	25V
C38	NCF21HZ-103	C CAP	0.010	50V
C39	NCF21EZ-104	C CAP	0.10	25V
C40	NCF21EZ-104	C CAP	0.10	25V
C41	NEN11EM-475	NP CAP	4.7	25V
C43	NCB21HK-472	C CAP	4700P	50V
C44	NCB21HK-222	C CAP	2200P	50V
C45	NCF21EZ-104	C CAP	0.10	25V
C46	NCF21EZ-104	C CAP	0.10	25V
C47	NCT03CH-221	C CAP	220P	50V
C48	NCT03CH-221	C CAP	220P	50V
C49	NEA11EM-106	E CAP	10	25V
C50	NCT03CH-6R0	C CAP	6.0P	50V
C52	NEF11AM-475	T CAP	4.7	10V
C53	NCT03CH-181	C CAP	180P	50V
C54	NCT03CH-181	C CAP	180P	50V
C55	NCT03CH-220	C CAP	22P	50V
C56	NCT03CH-220	C CAP	22P	50V
C57	NCB21HK-472	C CAP	4700P	50V
C58	NCB21HK-222	C CAP	2200P	50V
C60	NEA11EM-106	E CAP	10	25V
C61	NEA11EM-106	E CAP	10	25V
C62	NCF21HZ-473	C CAP	0.047	50V
C63	NEA10GM-476	E CAP	47	4V
C64	NCF21EZ-104	C CAP	0.10	25V
C65	NEN11EM-475	NP CAP	4.7	25V
C66	NEA11HM-105	E CAP	1.0	50V
C67	NEF11VM-104	T CAP	0.10	35V
C68	NEF11VM-104	T CAP	0.10	35V

Symbol No.	Part No.	Part Name	Description	
C69	NEF11AM-225	T CAP	2.2	10V
C70	NEF11CM-106	T CAP	10	16V
C71	NEF11CM-106	T CAP	10	16V
C72	NEF11CM-106	T CAP	10	16V
C73	NCT03CH-151	C CAP	150P	50V
C74	NCT03CH-151	C CAP	150P	50V
L1	SSV1330-150	COIL	15μ	
L2	SSV1330-150	COIL	15μ	
L3	SSV1330-150	COIL	15μ	
L4	SCV1950-4R7	PEAKING COIL	4.7μ	
L5	SCV1950-4R7	PEAKING COIL	4.7U	
X1	SCV1492-001	CRYSTAL	7.3728MHz	
X2	SCV1759-001	CRYSTAL	32.768MHz	
X3	SCV1867-001	CRYSTAL	650KHz	
S1	SCV1919-004	DIP SWITCH	CHECK/AB ON-OFF	
S2	QSRAA12-S01	ROTARY SWITCH	PB MONI. ON-OFF	
CN14	SCV1770-004	CONNECTOR	14 pin	
CN21	SSV1321-025	CONNECTOR	25 pin	
CN22	SSV1321-010	CONNECTOR	10 pin	
CN30	SCV1770-014	CONNECTOR	14 pin	
CN32	SCV1770-003	CONNECTOR	3 pin	
CN49	SCV1770-007	CONNECTOR	7 pin	
	CBM1	**CBMC2257-04-01A WB**	**DET(B) CBM**	
IC1	RC062M	I.C.(M)	JRC	
Q1	2SK198(Q.R)	FET	MATSUSHITA	
Q2	2SK360	FET	HITACHI	
Q3	2SC2406(S.T)	TRANSISTOR	MATSUSHITA	
Q4	2SA1022(B.C)	TRANSISTOR	MATSUSHITA	
Q5	2SK198(Q.R)	FET	MATSUSHITA	
Q7	2SJ84(Q.R)	FET	MATSUSHITA	
D1	MA152A	DIODE	MATSUSHITA	
D2	MA153	DIODE	MATSUSHITA	
R1	NRSA02J-103	MGR	10K	1/10W
R2	NRSA02J-103	MGR	10K	1/10W
R5	NRSA02J-102	MGR	1.0K	1/10W
R6	NRSA02J-104	MGR	100K	1/10W
R7	NRSA02J-333	MGR	33K	1/10W
R8	NRSA02J-222	MGR	2.2K	1/10W
R9	NRSA02J-472	MGR	4.7K	1/10W
R10	NRSA02J-104	MGR	100K	1/10W
R11	NRSA02J-334	MGR	330K	1/10W
R12	NRSA02J-154	MGR	150K	1/10W
R13	NRSA02J-473	MGR	47K	1/10W
R14	NRSA02J-334	MGR	330K	1/10W
R15	NRSA02J-104	MGR	100K	1/10W

Symbol No.	Part No.	Part Name	Description
R16	NRSA02J-103	MGR	10K 1/10W
R17	NRSA02J-224	MGR	220K 1/10W
R18	NRSA02J-682	MGR	6.8K 1/10W
R19	NRSA02J-332	MGR	3.3K 1/10W
R20	NRSA02J-333	MGR	33K 1/10W
R22	NRSA02J-473	MGR	47K 1/10W
R23	NRSA02J-103	MGR	10K 1/10W
R24	NRSA02J-393	MGR	39K 1/10W
VR1	NVP1501-104	V.RESISTOR	100K BLACK ADJ.
VR2	NVP1501-103	V.RESISTOR	10K WHITE ADJ.
C1	NEF11AM-475	T CAP	4.7 10V
C2	NEF11AM-475	T CAP	4.7 10V
C3	NCF21EZ-104	C CAP	0.10 25V

CBM2 CBMC2257-04-02A WB DET(G) CBM

Symbol No.	Part No.	Part Name	Description
IC1	RC062M	I.C.(M)	JRC
Q1	2SK198(Q.R)	FET	MATSUSHITA
Q2	2SK360	FET	HITACHI
Q3	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q4	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q5	2SK198(Q.R)	FET	MATSUSHITA
Q7	2SJ84(Q.R)	FET	MATSUSHITA
D1	MA152A	DIODE	MATSUSHITA
D2	MA153	DIODE	MATSUSHITA
R1	NRSA02J-103	MGR	10K 1/10W
R2	NRSA02J-103	MGR	10K 1/10W
R5	NRSA02J-102	MGR	1.0K 1/10W
R6	NRSA02J-104	MGR	100K 1/10W
R7	NRSA02J-333	MGR	33K 1/10W
R8	NRSA02J-222	MGR	2.2K 1/10W
R9	NRSA02J-472	MGR	4.7K 1/10W
R10	NRSA02J-104	MGR	100K 1/10W
R11	NRSA02J-334	MGR	330K 1/10W
R12	NRSA02J-154	MGR	150K 1/10W
R13	NRSA02J-473	MGR	47K 1/10W
R14	NRSA02J-334	MGR	330K 1/10W
R15	NRSA02J-104	MGR	100K 1/10W
R16	NRSA02J-103	MGR	10K 1/10W
R17	NRSA02J-224	MGR	220K 1/10W
R18	NRSA02J-682	MGR	6.8K 1/10W
R19	NRSA02J-332	MGR	3.3K 1/10W
R20	NRSA02J-333	MGR	33K 1/10W
R21	NRSA02J-472	MGR	4.7K 1/10W
R22	NRSA02J-473	MGR	47K 1/10W
R23	NRSA02J-103	MGR	10K 1/10W
R24	NRSA02J-393	MGR	39K 1/10W

Symbol No.	Part No.	Part Name	Description
VR1	NVP1501-104	V.RESISTOR	100K BLACK ADJ.
C1	NEF11AM-475	T CAP	4.7 10V
C2	NEF11AM-475	T CAP	4.7 10V
C3	NCF21EZ-104	C CAP	0.10 25V

CBM3 CBMC2257-04-03A WB DET(R) CBM

Symbol No.	Part No.	Part Name	Description
IC1	RC062M	I.C.(M)	JRC
Q1	2SK198(Q.R)	FET	MATSUSHITA
Q2	2SK360	FET	HITACHI
Q3	2SC2406(S.T)	TRANSISTOR	MATSUSHITA
Q4	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q5	2SK198(Q.R)	FET	MATSUSHITA
Q7	2SJ84(Q.R)	FET	MATSUSHITA
D1	MA152A	DIODE	MATSUSHITA
D2	MA153	DIODE	MATSUSHITA
R1	NRSA02J-103	MGR	10K 1/10W
R2	NRSA02J-103	MGR	10K 1/10W
R5	NRSA02J-102	MGR	1.0K 1/10W
R6	NRSA02J-104	MGR	100K 1/10W
R7	NRSA02J-333	MGR	33K 1/10W
R8	NRSA02J-222	MGR	2.2K 1/10W
R9	NRSA02J-472	MGR	4.7K 1/10W
R10	NRSA02J-104	MGR	100K 1/10W
R11	NRSA02J-334	MGR	330K 1/10W
R12	NRSA02J-154	MGR	150K 1/10W
R13	NRSA02J-473	MGR	47K 1/10W
R14	NRSA02J-334	MGR	330K 1/10W
R15	NRSA02J-104	MGR	100K 1/10W
R16	NRSA02J-103	MGR	10K 1/10W
R17	NRSA02J-224	MGR	220K 1/10W
R18	NRSA02J-682	MGR	6.8K 1/10W
R19	NRSA02J-332	MGR	3.3K 1/10W
R20	NRSA02J-333	MGR	33K 1/10W
R22	NRSA02J-473	MGR	47K 1/10W
R23	NRSA02J-103	MGR	10K 1/10W
R24	NRSA02J-393	MGR	39K 1/10W
VR1	NVP1501-104	TRIM.RESISTOR	100K BLACK ADJ.
VR2	NVP1501-103	V.RESISTOR	10K WHITE ADJ.
C1	NEF11AM-475	T CAP	4.7 10V
C2	NEF11AM-475	T CAP	4.7 10V
C3	NCF21EZ-104	C CAP	0.10 25V

7.12 FC board assembly 62

62□□□□□□

Symbol No.	Part No.	Part Name	Description
D1	MA153	DIODE	MATSUSHITA
D2	MA153	DIODE	MATSUSHITA
D3	MA153	DIODE	MATSUSHITA
D4	MA153	DIODE	MATSUSHITA
D5	MA153	DIODE	MATSUSHITA
D6	HZM6CTR	ZENER DIODE	HITACHI
R1	NRSA02J-222	MGR	2.2K 1/10W
R2	NRSA02J-222	MGR	2.2K 1/10W
R3	NRSA02J-222	MGR	2.2K 1/10W
R4	NRSA02J-222	MGR	2.2K 1/10W
R5	NRSA02J-222	MGR	2.2K 1/10W
S1	SCV1754-001	PUSH SWITCH	MENU
S2	SCV1754-001	PUSH SWITCH	SET
S3	SCV1754-001	PUSH SWITCH	CURSOR
S4	SCV1754-001	PUSH SWITCH	CURSOR
S5	SCV1754-001	PUSH SWITCH	DATA+
S6	SCV1754-001	PUSH SWITCH	DATA-
CN30	SCV1770-014	CONNECTOR	14 pin
CN41	SCV1837-S08	CONNECTOR	8 pin

7.13 TC board assembly 63
(GY-X1TC only)

63□□□□□□

Symbol No.	Part No.	Part Name	Description
IC1	VC2067A	I.C.(M)	JVC
IC2	PGD30561-G01	I.C.(M)	JVC
IC3	MC74HC08AF	I.C.(M)	MOTOROLA
IC5	M51946AF	I.C.(M)	MITSUBISHI
IC6	TC7S08F	I.C.(M)	TOSHIBA
Q1	2SB710(Q.R)	TRANSISTOR	MATSUSHITA
Q2	DTA124EK	TRANSISTOR	ROHM
Q3	DTC124EK	TRANSISTOR	ROHM
Q4	DTC124EK	TRANSISTOR	ROHM
Q5	DTC124EK	TRANSISTOR	ROHM
Q6	DTC124EK	TRANSISTOR	ROHM
Q7	DTC124EK	TRANSISTOR	ROHM
Q51	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q52	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q53	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q54	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q55	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q56	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
D1	MA153	DIODE	MATSUSHITA
D2	MA153	DIODE	MATSUSHITA
D3	MA153	DIODE	MATSUSHITA
D4	MA153	DIODE	MATSUSHITA
D5	MA152WA	DIODE	MATSUSHITA
D6	MA152WA	DIODE	MATSUSHITA
D7	MA152WA	DIODE	MATSUSHITA
D8	MA152WA	DIODE	MATSUSHITA
LD1	PGZ01172	L.E.D.	JVC
R1	NRSA02J-102	MGR	1.0K 1/10W
R2	NRSA02J-273	MGR	27K 1/10W
R3	NRSA02J-223	MGR	22K 1/10W
R4	NRSA02J-223	MGR	22K 1/10W
R5	NRSA02J-105	MGR	1.0M 1/10W
R6	NRSA02J-223	MGR	22K 1/10W
R7	NRSA02J-103	MGR	10K 1/10W
R8	NRSA02J-153	MGR	15K 1/10W
R9	NRSA02J-271	MGR	270 1/10W
R12	NRSA02J-101	MGR	100 1/10W
R13	NRSA02J-224	MGR	220K 1/10W
R14	NRSA02J-102	MGR	1.0K 1/10W
R15	NRSA02J-103	MGR	10K 1/10W
R16	NRSA02J-334	MGR	330K 1/10W
R17	NRSA02J-104	MGR	100K 1/10W
R18	NRSA02J-103	MGR	10K 1/10W
R19	NRSA02J-271	MGR	270 1/10W
R20	NRSA02J-104	MGR	100K 1/10W
R21	NRSA02J-104	MGR	100K 1/10W
R22	NRSA02J-104	MGR	100K 1/10W
R23	NRSA02J-104	MGR	100K 1/10W
R24	NRSA02J-104	MGR	100K 1/10W
R25	NRSA02J-104	MGR	100K 1/10W
R26	NRSA02J-104	MGR	100K 1/10W
R27	NRSA02J-104	MGR	100K 1/10W
R28	NRSA02J-0R0	MGR	0 1/10W
R29	NRSA02J-104	MGR	100K 1/10W

Symbol No.	Part No.	Part Name	Description
R30	NRSA02J-104	MGR	100K 1/10W
R31	NRSA02J-271	MGR	270 1/10W
R32	NRSA02J-271	MGR	270 1/10W
R33	NRSA02J-105	MGR	1.0M 1/10W
R34	NRSA02J-223	MGR	22K 1/10W
R35	NRSA02J-224	MGR	220K 1/10W
R36	NRSA02J-473	MGR	47K 1/10W
R37	NRSA02J-333	MGR	33K 1/10W
R38	NRSA02J-153	MGR	15K 1/10W
R51	NRSA02J-153	MGR	15K 1/10W
R52	NRSA02J-563	MGR	56K 1/10W
R53	NRSA02J-681	MGR	680 1/10W
R54	NRSA02J-182	MGR	1.8K 1/10W
R55	NRSA02J-562	MGR	5.6K 1/10W
R56	NRSA02J-102	MGR	1.0K 1/10W
R57	NRSA02J-561	MGR	560 1/10W
R58	NRSA02J-102	MGR	1.0K 1/10W
R59	NRSA02J-821	MGR	820 1/10W
R60	NRSA02J-561	MGR	560 1/10W
R61	NRSA02J-821	MGR	820 1/10W
R62	NRSA02J-681	MGR	680 1/10W
R63	NRSA02J-681	MGR	680 1/10W
R64	NRSA02J-562	MGR	5.6K 1/10W
VR1	NVP1501-103	V.RESISTOR	10K 4.7 ADJ
VR51	QVPB613-104	V.RESISTOR	100K H.PHASE
VR52	QVPB613-202	V.RESISTOR	2K SC FINE
C1	NCB21HK-222	C CAP	2200P 50V
C2	NEA11EM-475	E CAP	4.7 25V
C3	NCB21HK-332	C CAP	3300P 50V
C4	NCT03CH-100	C CAP	10P 50V
C6	NCT03CH-8R0	C CAP	8.0P 50V
C8	NEA11AM-336	E CAP	33 10V
C9	NCF21EZ-104	C CAP	0.10 25V
C10	NCT03CH-100	C CAP	10P 50V
C11	NCT03CH-100	C CAP	10P 50V
C12	NCT03CH-100	C CAP	10P 50V
C13	NCT03CH-220	C CAP	22P 50V
C14	NCF21EZ-104	C CAP	0.10 25V
C15	NEA11AM-336	E CAP	33 10V
C16	NCF21EZ-104	C CAP	0.10 25V
C17	NEA11AM-336	E CAP	33 10V
C18	SMV2209-104	EDL CAPACITOR	0.1 5.5V
C19	NCS21HJ-102	C CAP	1000P 50V
C20	NCF21EZ-104	C CAP	0.10 25V
C21	NCF21EZ-104	C CAP	0.10 25V
C22	NCF21EZ-104	C CAP	0.10 25V
C23	NEA11AM-336	E CAP	33 10V
C24	NCT03CH-101	C CAP	100P 50V
C51	NCT03CH-151	C CAP	150P 50V
C52	NCT03CH-220	C CAP	22P 50V
C53	NCF21EZ-104	C CAP	0.10 25V
C54	NCT03CH-101	C CAP	100P 50V
C55	NCT03CH-101	C CAP	100P 50V
C56	NCT03CH-680	C CAP	68P 50V
C57	NCF21EZ-104	C CAP	0.10 25V

Symbol No.	Part No.	Part Name	Description
L1	SSV1330-150	COIL	15μ
L51	SCV1950-220	PEAKING COIL	22μ
L52	SCV1950-390	PEAKING COIL	39μ
X1	SCV1974-002	CRYSTAL	14.5MHz
X2	SCV1863-001	CRYSTAL	4.194304MHz
X3	SCV1864-001	CRYSTAL	32.768KHz
S1	SCV1754-001	PUSH SWITCH	PRESET
S2	SCV1754-001	PUSH SWITCH	ADVANCE
S3	SCV1754-001	PUSH SWITCH	SHIFT
S4	SCV1754-001	PUSH SWITCH	HOLD
S5	SCV0403-001	SLIDE SWITCH	TC/UB
S6	SCV0403-001	SLIDE SWITCH	VITC ON/OFF
S7	SCV0403-001	SLIDE SWITCH	REC RUN/FRE.RUN
S8	QSR0096-L03	ROTARY SWITCH	VITC POSITION
S9	QSR0096-L03	ROTARY SWITCH	VITC POSITION
S10	SCV1919-004	DIP SWITCH	LTC/N-P/DF-NDF
S51	QSS1A13-S01	SLIDE SWITCH	0-120-240
CN23	SCV1770-007	CONNECTOR	7 pin
CN45	SCV1770-005	CONNECTOR	5 pin

7.14 PS1 board assembly 6 4

6 4 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	MC14001BFL	I.C.(M)	MOTROLA
IC2	NJM79M05A	I.C.(M)	JRC
Q1	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q2	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SC2295(B.C)	TRANSISTOR	MATSUSHITA
Q4	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q5	2SD1348(S.T)	TRANSISTOR	SANYO
Q6	2SD1348(S.T)	TRANSISTOR	SANYO
D1	MA152WA	DIODE	MATSUSHITA
D2	ERA82-004PNLB	DIODE	FUJI ELECTRIC
D3	ERA82-004PNLB	DIODE	FUJI ELECTRIC
D4	ERA82-004PNLB	DIODE	FUJI ELECTRIC
D5	ERA82-004PNLB	DIODE	FUJI ELECTRIC
D6	MA153	DIODE	MATSUSHITA
R1	NRSA02J-471	MGR	470 1/10W
R2	NRSA02J-471	MGR	470 1/10W
R3	NRSA02J-471	MGR	470 1/10W
R4	NRSA02J-471	MGR	470 1/10W
R5	QRD161J-180	CR	18 1/6W
C1	QETA1AM-477	E CAP	470 10V
C2	QER41EM-106	E CAP	10 25V
C3	QER41EM-106	E CAP	10 25V
C4	QETA1AM-227	E CAP	220 10V
C5	QETA1EM-477	E CAP	470 25V
C6	QETA1EM-477	E CAP	470 25V
C7	QETA1AM-477	E CAP	470 10V
C8	QETA1AM-477	E CAP	470 10V
C9	QER41EM-106	E CAP	10 25V
C10	QFN41HJ-392	MY CAP	3900P 50V
L1	SCVO983-500	PEAKING COIL	50μ
L2	SCVO983-500	PEAKING COIL	50μ
L3	SCVO983-500	PEAKING COIL	50μ
CN11	SSV1591-S09	CONNECTOR	9 pin
CN49	SSV1591-L02	CONNECTOR	2 pin
CP1	ICP-F10	I.C.PROTECTOR	
CP2	ICP-F10	I.C.PROTECTOR	
T1	SCV1312-002	DRIVE TRANSF.	

7.15 PS2 board assembly 6 5

6 5 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	TL1451CNS	I.C.(M)	TEXAS
IC2	NJM2904L	I.C.(M)	JRC
Q1	2SA1244(Y)	TRANSISTOR	
Q2	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q3	2SA1244(Y)	TRANSISTOR	
Q4	2SA1022(B.C)	TRANSISTOR	MATSUSHITA
Q5	2SA1357(O)	TRANSISTOR	TOSHIBA
Q6	2SA1357(O)	TRANSISTOR	TOSHIBA
D1	SB540	DIODE	GENERAL INST
D2	SB540	DIODE	GENERAL INST
D3	HZ5B1	ZENER DIODE	HITACHI
D4	HZT7A2	ZENER DIODE	HITACHI
R1	NRSA02J-562	MGR	5.6K 1/10W
R2	NRSA02J-562	MGR	5.6K 1/10W
R3	NRSA02J-562	MGR	5.6K 1/10W
R4	NRSA02J-562	MGR	5.6K 1/10W
R5	NRSA02J-221	MGR	220 1/10W
R6	NRSA02J-152	MGR	1.5K 1/10W
R7	NRSA02J-152	MGR	1.5K 1/10W
R8	NRSA02J-104	MGR	100K 1/10W
R9	NRSA02J-562	MGR	5.6K 1/10W
R10	NRSA02J-123	MGR	12K 1/10W
R11	NRSA02J-104	MGR	100K 1/10W
R12	NRSA02J-562	MGR	5.6K 1/10W
R13	NRSA02J-271	MGR	270 1/10W
R14	NRSA02J-152	MGR	1.5K 1/10W
R15	NRSA02J-152	MGR	1.5K 1/10W
R16	NRSA02J-153	MGR	15K 1/10W
R17	NRSA02J-182	MGR	1.8K 1/10W
R18	NRSA02J-103	MGR	10K 1/10W
R19	NRSA02J-272	MGR	2.7K 1/10W
R20	NRSA02J-472	MGR	4.7K 1/10W
R21	NRSA02J-221	MGR	220 1/10W
R22	NRSA02J-472	MGR	4.7K 1/10W
R23	NRSA02J-101	MGR	100 1/10W
R24	NRSA02J-331	MGR	330 1/10W
R25	NRSA02J-332	MGR	3.3K 1/10W
R26	NRSA02J-123	MGR	12K 1/10W
R27	NRSA02J-562	MGR	5.6K 1/10W
R28	NRSA02J-153	MGR	15K 1/10W
R29	NRSA02J-223	MGR	22K 1/10W
R30	NRSA02J-224	MGR	220K 1/10W
R31	NRSA02J-822	MGR	8.2K 1/10W
R33	NRSA02J-184	MGR	180K 1/10W
R34	NRSA02J-224	MGR	220K 1/10W
VR1	QVPB614-501	VR	500 9.8V ADJ
VR2	QVPB614-202	VR	2K 9V ADJ
C1	QETA1EM-477	E CAP	470 25V
C2	NCS21HJ-102	C CAP	1000P 50V
C3	QCT25CH-151	C CAP	150P 50V
C4	NCB21HK-103	C CAP	0.010 50V
C5	NCB21HK-103	C CAP	0.010 50V

7.16 MT1 board assembly 66

66☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
C6	QCT25CH-151	C CAP	150P 50V
C7	QETC1AM-108	E CAP	1000 10V
C8	QEX41AK-226	E CAP	22 10V
C9	QER41EM-106	E CAP	10 25V
C10	QETA1CM-108	E CAP	1000 16V
C11	QEX41CM-156	E CAP	15 16V
C12	QER41EM-106	E CAP	10 25V
C14	QETA1EM-477	E CAP	470 25V
C15	QCZ0206-104	C CAP	0.10
C16	QETA1AM-108	E CAP	1000 10V
C17	QEJ41VM-474	T CAP	0.47 35V
C18	QEJ41AM-157	T CAP	150 10V
L1	SCV1957-001	PEAKING COIL	120μ
L2	SCV1957-001	PEAKING COIL	120μ
L3	SCV1957-001	PEAKING COIL	120μ
CN29	SSV1591-S07	CONNECTOR	7 pin
CN42	SSV1591-S03	CONNECTOR	3 pin
CN53	SSV1591-S02	CONNECTOR	2 pin

Symbol No.	Part No.	Part Name	Description
IC1	MC74HC165F	I.C.(M)	MOTOROLA
IC2	MC14094BF	I.C.(M)	MOTOROLA
IC3	RC062M	I.C.(M)	JRC
R1	NRSA02J-394	MGR	390K 1/10W
R2	NRSA02J-271	MGR	270 1/10W
R3	NRSA02J-104	MGR	100K 1/10W
RA1	NRB151J-223	RESISTOR ARRAY	22K x 8
C1	NCF21EZ-104	C CAP	0.10 25V
C2	NCF21EZ-104	C CAP	0.10 25V
C3	NCF21HZ-103	C CAP	0.010 50V
LC1	EXC-EMT271BC	EMI FILTER	MURATA
LC2	EXC-EMT271BC	EMI FILTER	MURATA
LC3	EXC-EMT271BC	EMI FILTER	MURATA
LC4	EXC-EMT271BC	EMI FILTER	MURATA
LC5	EXC-EMT271BC	EMI FILTER	MURATA
LC6	EXC-EMT271BC	EMI FILTER	MURATA
CN8	SCV1074-014	CONNECTOR	14 pin
CN15	SCV1771-006	CONNECTOR	6 pin
CN17	SCV1771-005	CONNECTOR	5 pin
CN19	SCV1766-020	CONNECTOR	20 pin
CN20	SCV1766-020	CONNECTOR	20 pin
CN21	SCV1766-025	CONNECTOR	25 pin
CN22	SCV1766-010	CONNECTOR	10 pin
CN24	SCV1771-004	CONNECTOR	4 pin
CN28	SCV1766-025	CONNECTOR	25 pin

7.17 MT2 board assembly 6 7

6 7 □ □ □ □ □ □

Symbol No.	Part No.	Part Name	Description
IC1	MC74HC165F	I.C.(M)	MOTOROLA
IC2	MC74HC165F	I.C.(M)	MOTOROLA
R1	NRSA02J-223	MGR	22K 1/10W
RA1	NRB151J-223	RESISTOR ARRAY	22K x 8
C1	QETA1EM-108	E CAP	1000 25V
C2	NCF21EZ-104	C CAP	0.10 25V
C3	QER40JM-476	E CAP	47 6.3V
CN13	SCV1769-003	CONNECTOR	3 pin
CN16	SCV1769-009	CONNECTOR	9 pin
CN23	SCV1769-007	CONNECTOR	7 pin
CN25	SSV1591-S03	CONNECTOR	3 pin
CN26	SCV1769-008	CONNECTOR	8 pin
CN28	SCV1766-025	CONNECTOR	25 pin
CN31	SCV1769-005	CONNECTOR	5 pin
CN36	SCV1769-006	CONNECTOR	6 pin
FC1	SCV1271-001	FUSE CLIP	
FC2	SCV1271-002	FUSE CLIP	

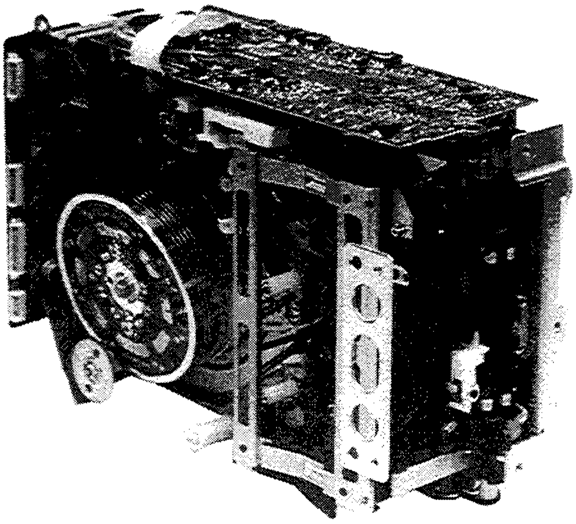
7.18 SW5 board assembly 6 8

6 8 □ □ □ □ □ □

Symbol No.	Part No.	Part Name	Description
R2	QRD161J-822	CR	8.2K 1/6W
R3	QRD161J-183	CR	18K 1/6W
S13	SCV1639-001	PUSH SWITCH	EDIT REV
S14	SCV1639-001	PUSH SWITCH	EDIT FWD

GY-X1TCE/GY-X1E

VTR ASSEMBLY SECTION



SECTION 1
DISASSEMBLY

1.1 REMOVING OF MAIN BOARDS

Note:
- When removing and reinstalling P.C. boards, make sure to turn off the power supply.
- All parts such as P.C. boards and connectors, etc. which were once removed from the set must be put back as they were.

Name of P.C. board (see figures)	Procedure
01 S/S (Fig. 1-3)	• Remove 02 Y/C board. (see the following) • Disconnect the connector Ⓙ which is connected to 03 AUDIO board. • Remove three screws Ⓐ, Ⓑ and Ⓒ. • Disconnect connectors Ⓓ, Ⓔ, Ⓕ, Ⓖ and Ⓗ (8 pcs in total). • Disconnect flat cables Ⓘ and Ⓚ. **Note:** Since the three screws Ⓐ, Ⓑ and Ⓒ are different from each other, carefully use them at reassembling. (Ⓐ : SPSH1712M, Ⓑ : SPSH1730M, Ⓒ : SPSN1740M)
02 Y/C (Fig. 1-1)	• Remove a screw Ⓝ. • Disconnect a connector Ⓡ and flat cables Ⓞ, Ⓟ and Ⓠ, and then open the board (in the direction of the arrow Ⓢ). **Note:** For disconnecting the flat cables, it is advised to remove the brackets. • The board will be disconnected from the connector Ⓣ by drawing it out.
03 AUDIO (Fig. 1-2)	• Remove a screw Ⓤ and sheet. • Taking care of wires, disconnect the connector Ⓙ which is for connection to 01 S/S board. (The wires will be loosened by releasing them from the binder. After reassembling the board to the set, make sure to bind the wires as they were.) • Disconnect flat cables Ⓛ, Ⓜ and Ⓥ.
04 PRE AMP (Fig. 1-5)	• Remove 01 S/S board and 02 Y/C board. (see the above descriptions) • Unsolder the relay pins connected to the board (at 14 points) and carefully remove the solder entirely. **Note:** If there is any solder remaining around the pin, the pin may come off. • Remove a screw Ⓦ.
06 IF (Fig. 1-6)	• Remove three screws ⊗ retaining the IF board.

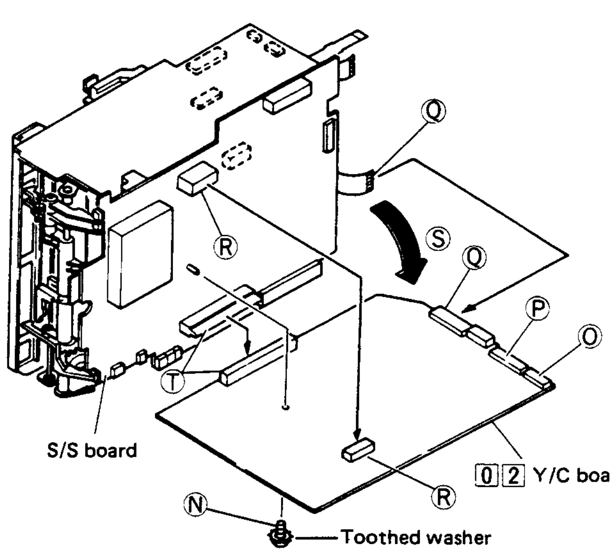

Ⓠ
Ⓡ
Ⓢ
Ⓠ
Ⓟ
Ⓞ
Ⓣ
S/S board
02 Y/C board
Ⓡ
Ⓝ
Toothed washer

Fig. 1-1

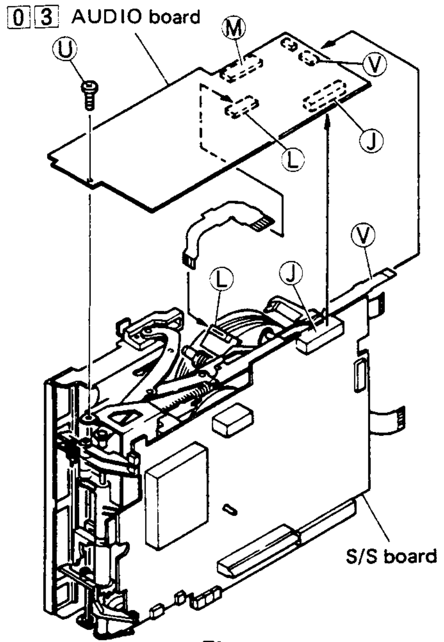

03 AUDIO board
Ⓜ
Ⓤ
Ⓥ
Ⓛ
Ⓙ
Ⓥ
Ⓛ
Ⓙ
S/S board

Fig. 1-2

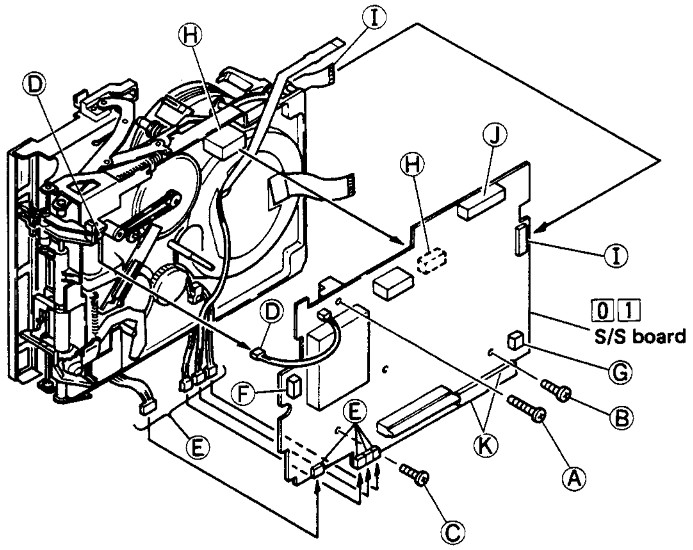


Fig. 1-3

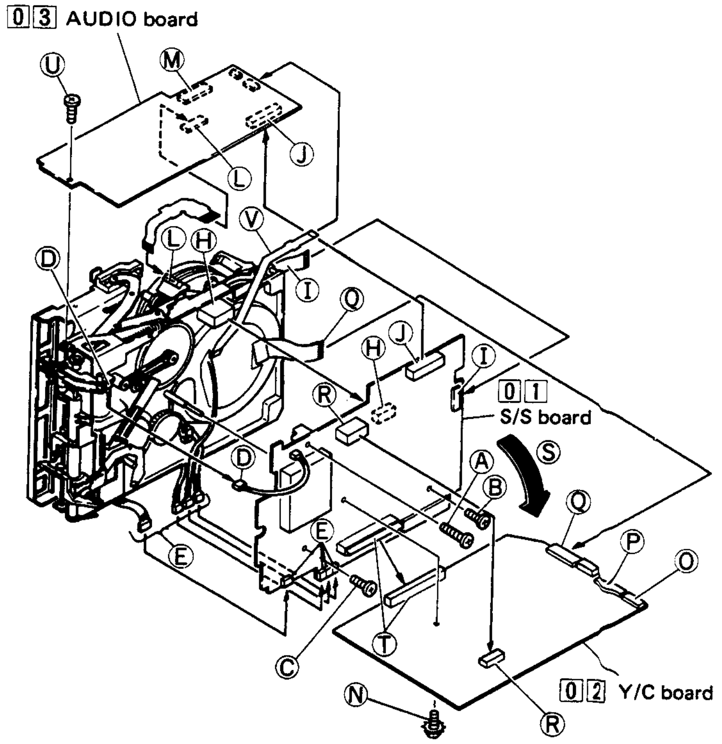

03 AUDIO board
Ⓤ
Ⓜ
Ⓛ
Ⓙ
ⓁⒽ
Ⓥ
Ⓓ
Ⓘ
Ⓠ
Ⓗ
Ⓙ
Ⓘ
Ⓡ
01 S/S board
Ⓢ
Ⓐ
Ⓑ
Ⓠ
Ⓟ
Ⓞ
Ⓓ
Ⓔ
Ⓔ
Ⓒ
Ⓣ
Ⓝ
02 Y/C board
Ⓡ

Fig. 1-4

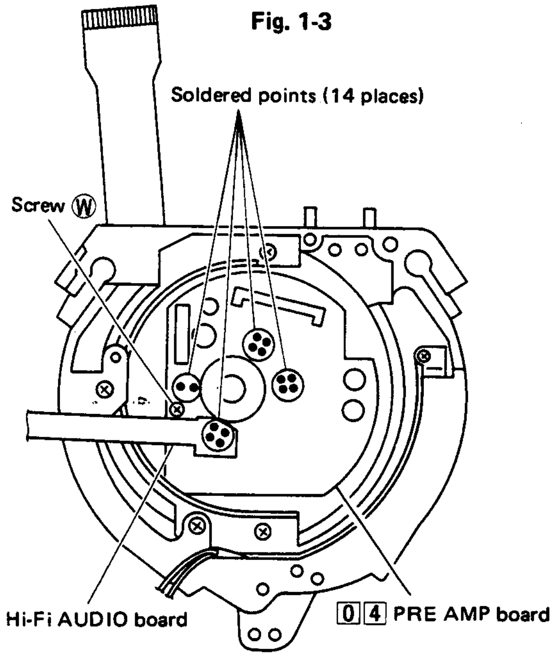

Soldered points (14 places)
Screw Ⓦ
Hi-Fi AUDIO board
04 PRE AMP board

Fig. 1-5

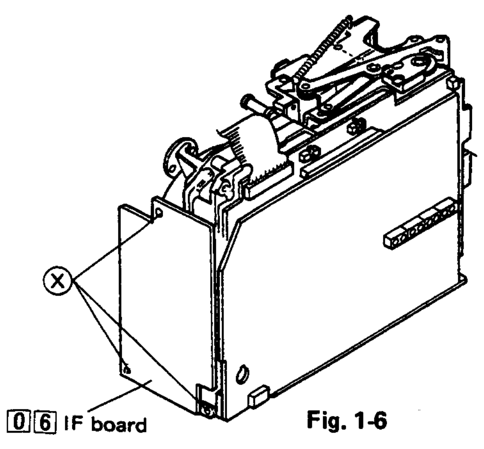


Fig. 1-6

- **Set of patch cords (YTU93022A)**

To be used as extension codes for connection between the Y/C board and the mechanism deck or IF board as well as between the S/S board and them for inspection and adjustment.

This set of patch cords is the same as that used for the GR-S707EG. (Parts number : YTU93022A)
The following table indicates connections applicable to respective patch cords.

Parts Number	Connection between			
YTU93022-6	S/S board CN4	↔	AUDIO board CN1	⑥
YTU93022-7	S/S board CN6	↔	Y/C board CN2	②
YTU93022-8	S/S board CN5	↔	Capstan motor	⑦
YTU93022-9	S/S board CN3	↔	Drum motor	⑧
YTU93022-10	S/S board CN13	↔	Loading motor	⑨
YTU93022-13	Y/C board CN5	↔	IF board CN10	③
YTU93022-14	Y/C board CN4	↔	PRE AMP board CN1	④
YTU93022-15	AUDIO board CN3	↔	IF board CN3	⑤

Note: YTU93022-1 to -5, -11 and -12 are not used for the GY-X1 series.

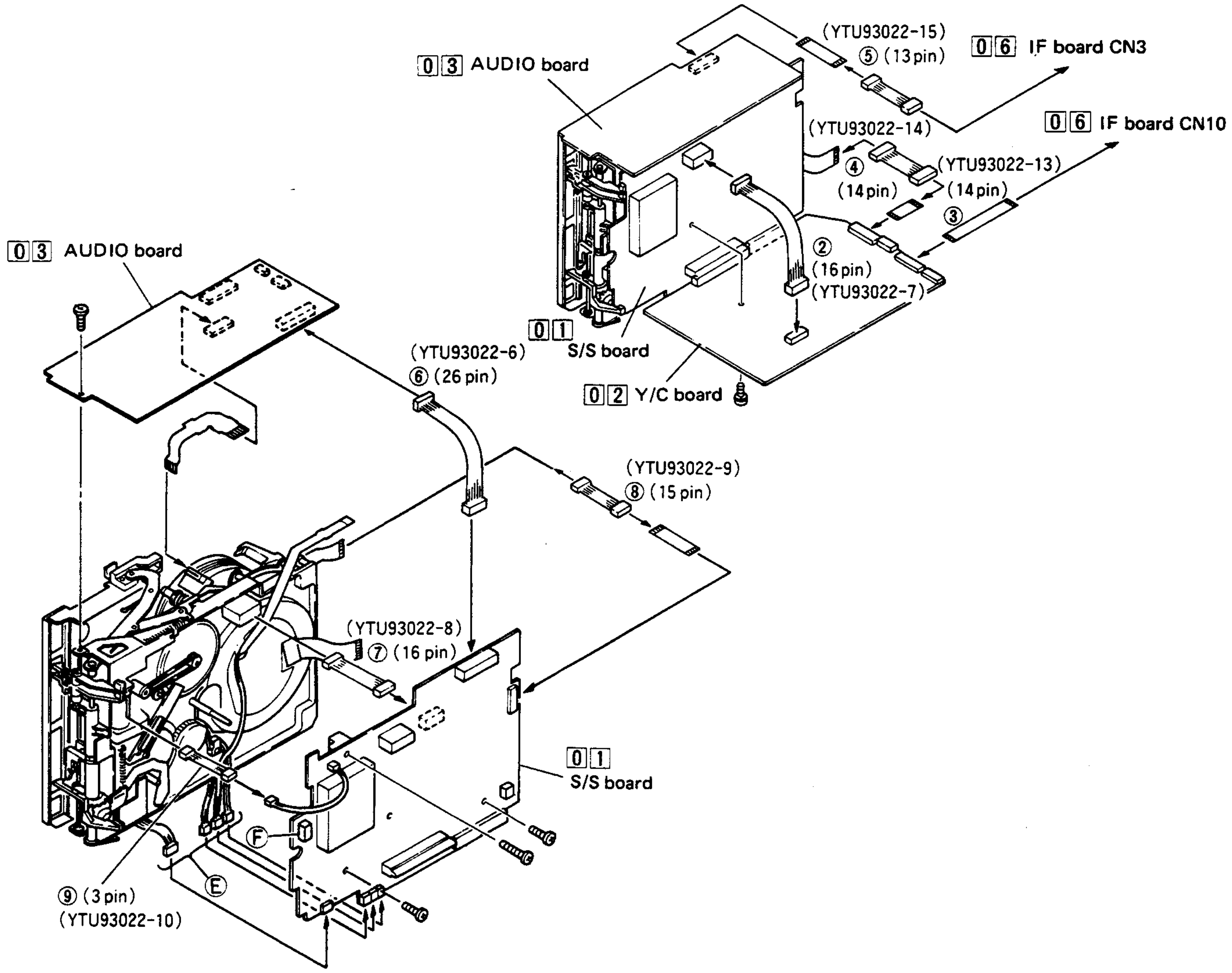

(YTU93022-15)
⑤ (13pin)
06 IF board CN3
03 AUDIO board
(YTU93022-14)
06 IF board CN10
(YTU93022-13)
④
(14pin)
(14pin)
③
②
(16pin)
(YTU93022-7)
03 AUDIO board
01
S/S board
(YTU93022-6)
⑥ (26 pin)
02 Y/C board
(YTU93022-9)
⑧ (15 pin)
(YTU93022-8)
⑦ (16 pin)
01
S/S board
F
E
⑨ (3 pin)
(YTU93022-10)

Fig. 1-7

1.2 POWER SUPPLY

Power is supplied from the camera head to the connector CN18 of the IF board. If the wire assy connected with CN18 is removed, connect it as it was.
When the POWER switch of the camera head is turned on, the power is supplied to the VTR, too.

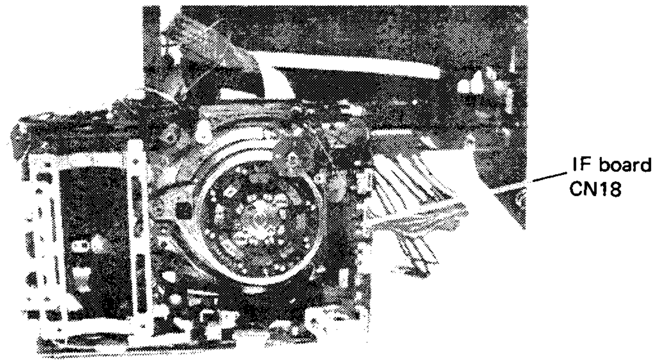
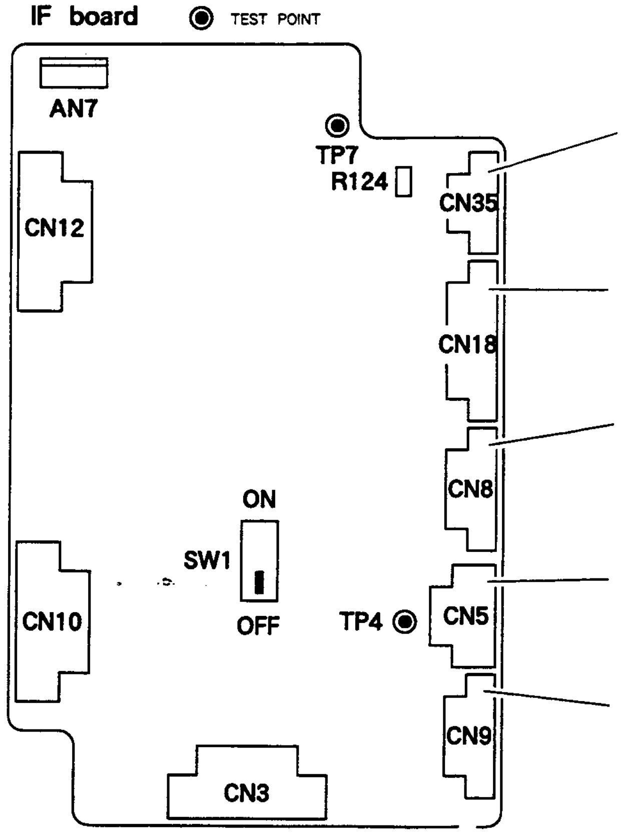

IF board
CN18

Fig. 1-8

1.3 VIDEO, AUDIO, CONTROL SIGNAL INPUT

These signals are also supplied from the camera head to the IF board. (See Fig. 1-9.)

- Video signal (including color bar) from the camera is supplied to CN35.
- Audio signal from microphone is supplied to CN9.
- Control signal is supplied to CN18 and CN5.


IF board
◉ TEST POINT
AN7
TP7
R124
CN35
CN12
CN18
CN8
ON
SW1
OFF
CN10
TP4
CN5
CN9
CN3

Connected with CN35 of the SECC board.
Video signal from camera is inputted in the form of Y/C signal.
For audio inspection, this need not be connected.

Connected with AN18 of the MT1 board.
VTR control signal is inputted besides DC 12 V.
This must always be connected.

Connected with AN37 of the MT1 board.
Outputs EE/PB video signal and audio signal to the camera head.
For mechanism inspection only, this need not be connected.

Connected with CN5 of the LD board.
Control signals of VTR operation buttons are inputted.
This must always be connected.

Connected with the audio box (on the left side cover) of the camera head.
Audio signals from built-in/external microphones are inputted.
For video inspection only, this need not be connected.

Fig. 1-9 IF board (viewed from drum head side)

1.4 EXTERNAL VIDEO SIGNAL INPUT

To input external video signal:
- disconnect CN35,
- shortcircuit R124,
- supply external video signal to TP7.

See Fig. 1-9.

Note:
- After measurement, make sure to connect CN35 and to make R124 open.
- External video signal is supplied only to the Y signal circuits, therefore, this input method is available only for inputting sweep signal, etc.

SECTION 2
MECHANICAL ADJUSTMENT

2.1 PRECAUTION

1. Before proceeding to do any adjustment, carefully read related manuals for well understanding of this set.
2. Since the set is previsely adjusted before shipment, do not disturb controls and parts other than those which will be described in this section and need adjustment owing to replacement or fault.
3. For checkup and adjustment, it is the first condition that there are proper tools and measuring apparatuses prepared. In practical work, be the most careful not to damage any of the mechanism parts (particularly the tape transport mechanism parts and drum, etc.) by tools, etc.
4. Parts replacement and soldering must be performed after the DC IN connector and the battery are disconnected or removed.
5. Pay enough attention to screws and washers, etc. not to drop them into the mechanism.
6. Precisely perform mechanism adjustment since many items are closely related to electrical adjustment as well as correct mechanism adjustment is the fundamental factor to perform accurate electrical adjustment.
7. After checkup and adjustment, make sure to clean the tape transport mechanism. In addition, periodical inspection and maintenance are the most important to use the set with its original capacity and to protect tapes from damage.

Note: Before proceeding to mechanical adjustment, set a connected VTR into operative state referring to Sections 1.2 and 1.3.

2.2 REQUIRED TEST EQUIPMENT AND TOOLS

1. To perform mechanism adjustment properly with ease, the following special test equipment and tools are necessities besides general tools.
   Mechanism adjustment without them results in unsatisfactory results in accuracy and performance after repeated trial and error.

Note: For test equipment and tools necessary for electrical adjustment, refer to Section 3.2 of this manual.

2. In addition to the special test equipment and tools, the following measuring instruments and tools are necessary.

- Color TV monitor
- Hex. wrench (for 2 mm [0.9 mm], for 2.6 mm [1.27 mm] and for 3 mm [1.5 mm])
- Oscilloscope (wide-band)
- Blank tape for recording (SE-C30 [S-VHS] / E-C30 [VHS])
- Blank tape for tape travel check (SE-C30 [S-VHS] / E-C30 [VHS])
- A variety of screwdrivers
- Other general tools

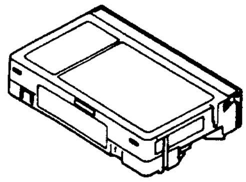
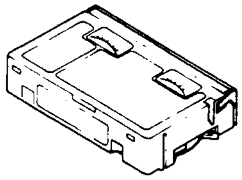
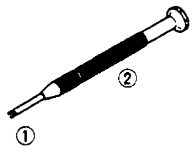
Alignment tape (for SP interchangeability) (MHPE-C or MH-C2)	Cassette torque meter PUJ50431-2	A/C head positioning tool YTU93002A (incl. ① & ②)
		① YTU93002-01 Bit tool ② PD-3.0 Handle  Orders for ① and ② can be placed separately.

Fig. 2-1 Special test instrument and tool

2.3 LOCATION OF MAIN PARTS

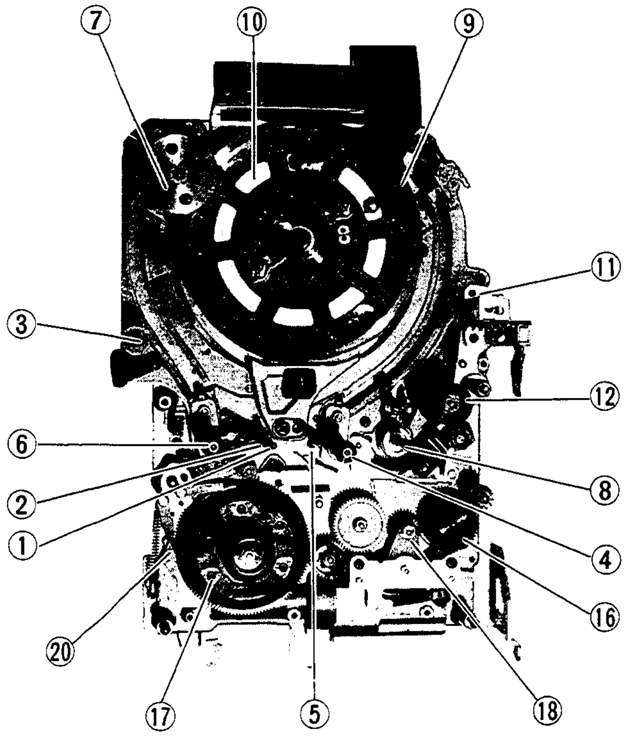


Fig. 2-2 Mechanism parts location (Top view)

1	Tension pole
2	Supply slant pole
3	Supply guide roller
4	Take-up guide roller assy
5	Take-up slant pole
6	Supply guide roller assy
7	Impedance roller
8	Capstan shaft
9	Lower drum assy
10	Upper drum assy
11	A/C head
12	Pinch roller
13	Capstan motor
14	Timing belt
15	Loading motor
16	Take-up clutch
17	Supply reel disk
18	Center pulley
19	Brush
20	Tension band
21	Capstan brake

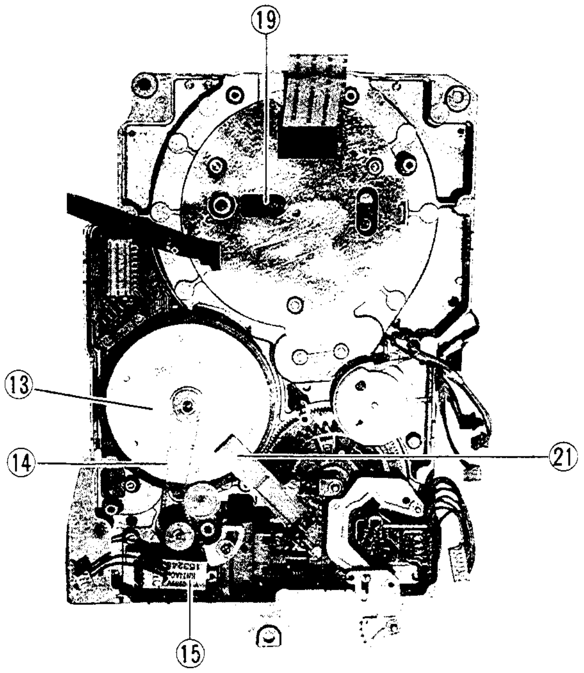


Fig. 2-3 Mechanism parts location (Bottom view)

2.4 STANDARD MAINTENANCE/INSPECTION SCHEDULE OF MAIN COMPONENT PARTS

In order to ensure the full capacity and relability of this set, periodic inspection and maintenance are required.
The following table has been compiled based on the standard condition, and in practice it will vary widely according to environmental and usage conditions.
Nonfulfilment of the maintenance work not only shortens the standard period sharply but also influences other component parts badly.
Also be aware that rubber parts may deform and age even when the set is not used. The upper drum life is particularly affected by environmental and usage condition.

Section	No.	Parts Name	Parts No.	Periodic Servicing Schedule (operating hours)									Related section
				250	500	750	1000	1250	1500	1750	2000	3000	
Tape transport system	1	Tension pole	YQ41007A	★	★	★	★	★	★	★	★	★	
	2	Supply slant pole	YQ41016A										
	3	Supply guide roller	YQ41004										
	4	Take-up guide roller assy	YQ41021A	★	★	★	☆	★	★	★	☆	☆	
	5	Take-up slant pole	YQ41029A	★	★	★	★	★	★	★	★	★	
	6	Supply guide roller assy	YQ41021A	★	★	★	☆	★	★	★	☆	☆	
	7	Impedance roller	YDM4049A-2	★	★	★	☆	★	★	★	☆	☆	
	8	Capstan shaft	—	★	★	★	★	★	★	★	★	★	
	9 10	Lower drum assy Upper drum assy	YDV2032A	★	★	☆	●	★	★	☆	●	●	2.5.8
	11	A/C head	YQ41030A-5	★	★	★	★	★	★	★	★	●	2.5.4
	12	Pinch roller	YQ40373A	★	☆	★	☆	★	☆	★	☆	●	2.5.12
Driving system	13	Capstan motor	YU40990V-1				○				●	○	2.5.13
	14	Timing belt	YQ41084				○				●	○	–
	15	Loading motor	YU40989V-1									●	2.5.6
	16	Take-up clutch	YU40992	△	△	△	▲	△	△	△	▲	▲	2.5.14
	17	Supply reel disk	YU40997	△	△	△	▲	△	△	△	▲	▲	2.5.3
	18	Center pulley	YU40991-1-1				○				○	○	2.5.5
Others	19	Brush	YU40993				○				○	○	2.5.9
	20	Tension band	YQ41010A		○		○		○		○	○	2.5.3
	21	Capstan brake	YU41159		○		○		○		○	●	–

★ : Cleaning
☆ : Cleaning, or replace if necessary
△ : Lubrication
A : For replacement, the spare is provided as an assembly parts.
▲ : Lubrication, or replace if necessary
● : Replacement
○ : Inspection, or replace if necessary

Table 2-1 Maintenance/inspection schedule of main parts

Note: Slit washers (PQM30017-25, 27) which have been removed for parts replacement, etc. cannot be reused. When reassembling parts, make sure to use new ones of the slit washers.

- **Remarks**

1. Cleaning

1) For cleaning of the upper drum (particularly video heads, use fine-woven cotton cloth or Kimwipe which alcohol soakd through. Regarding cleaning manner, do not move the cloth but turn the upper drum counterclockwise.
   Note: Make sure not to move the cloth in the vertical direction to the video head, since it causes damage on the video heads.
2) For cleaning of parts of the tape transport system except the upper drum, use fine-woven cotton cloth or cotton swab soaked alcohol.
3) Before loading the deck with cassette tape, confirm that the cleaned parts are completely dry.

2. Oiling and greasing

1) Periodic oiling and greasing are not required. Apply oil or grease to new parts only when they are newly installed. If oil or grease on the other party is dirty, wipe it off and apply new oil or grease.
2) For parts and points to apply oil and grease, refer to the exploded view diagram (M3) of the mechanism assembly. Table 2-2 specifies oil and grease to be used.
3) When oiling, clean the subject parts first and then apply one or two drop(s) of oil. Too much oiling cause rotary parts to slip because of oil leakage.

Table 2-2 Specific oil and grease used in this set

Classification	Name	Part No.	Symbol in drawing
Grease	Moriton Grease No.1	MOS2-C	A
Grease	Fuloil G-31KAV	Kanto-G-31KAV	B
Oil	Cosmo Hydro HV100	YTU94027	C

3. Checkup

After replacement of the supply reel disk and tension band, make sure to inspect and adjust back tension according to the adjustment procedure of the deck section.

2.5 REPLACEMENT OF MAIN PARTS

This section describes removing and replacing manner of main component parts. For periodic work and servicing, refer to the following.
If necessary, remove the external covers, printed circuit boards, cassette housing, etc.

2.5.1 Removing and replacing cassette housing

1. Remove a screw and the bracket.
2. Remove five screws Ⓐ and detach the cassette housing from the mechanism.

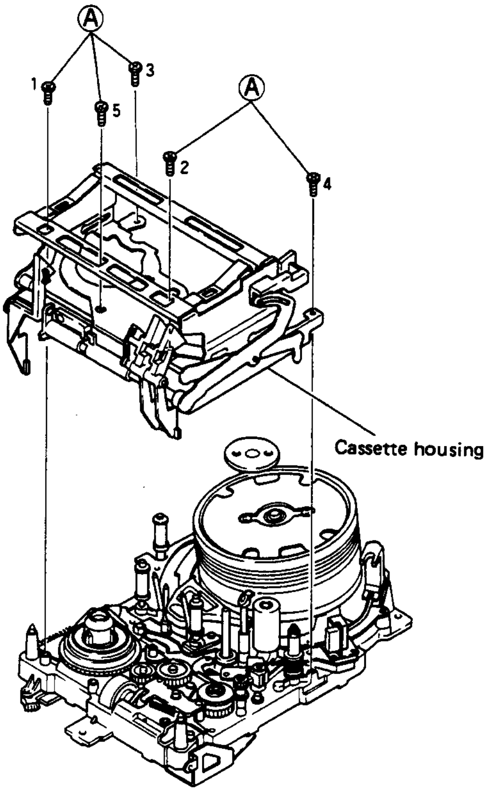


Fig. 2-4 Cassette housing

After the cassette housing is replaced or reassembled, confirm the following things as the cassette housing is closed as shown in Fig. 2-5.

1) Phase of eject gear
2) Position of leaf switch
3) Order of screwing (Fig. 2-4)

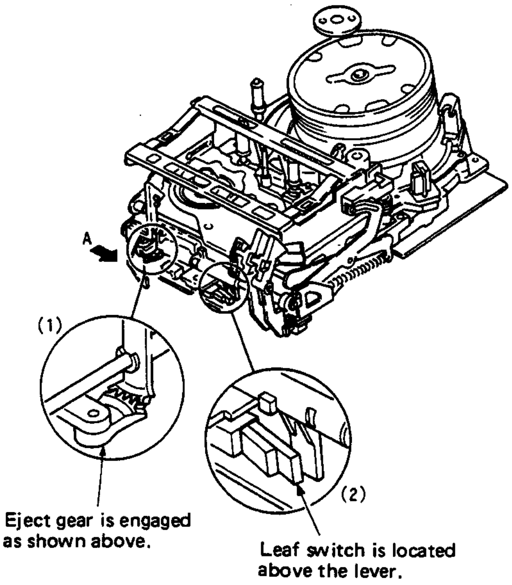

A
(1)
(2)
Eject gear is engaged as shown above.
Leaf switch is located above the lever.

Fig. 2-5

2.5.2 Manual setting of cassette housing to Eject mode

Without use of the EJECT switch of the main body, set the cassette housing to the Eject mode as shown in Fig. 2-6.

1. Push the pawl Ⓐ with the tip of a screwdriver or the like in the direction of the arrow mark Ⓑ.

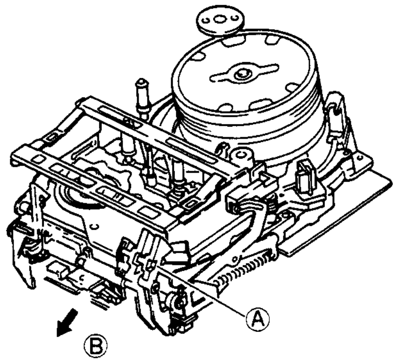


Fig. 2-6

2.5.3 Removing of tension band and supply reel disk

1. Take off the cassette housing. (See 2.5.1.)
2. Remove a slit washer (PQM30017-27) and a screw retaining the tension band assy, and the tension band assy can be removed.
3. Next, remove a slit washer (PQM30017-27) retaining the supply reel disk.
4. By lifting the reel disk along the shaft, it can be removed.
5. After the supply reel disk and tension band are installed again, checkup and adjust the following things.

1) Back tension (See 2.8, No. 1.)
2) Tape pattern (See 2.8, No. 2.)

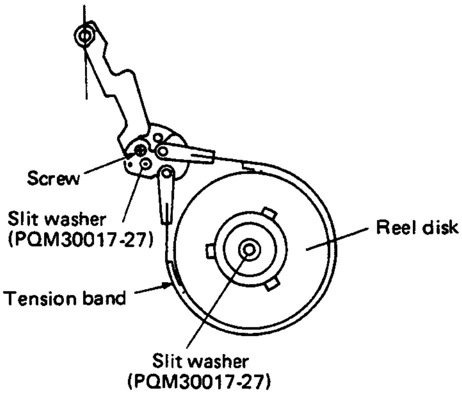

Screw
Slit washer
(PQM30017-27)
Tension band
Reel disk
Slit washer
(PQM30017-27)

Fig. 2-7

2.5.4 Removing of A/C head

1. Set the cassette housing to the Eject mode manually. (See 2.5.2.)
2. Disconnect the flat cable which is connected to the A/C HEAD board.
3. Remove a nut retaining the A/C head arm assy, and the A/C head arm assy can be removed.
4. For reassembling the A/C head arm assy, turn the nut 8–9 turns.
5. Then, perform the following checkup and adjustment.

1) A/C head adjustment (See 2.8, No. 3.)
2) Checkup and adjustment of tape transport system (See 2.8.)
3) Electrical adjustment of audio circuit (See 3.3.)

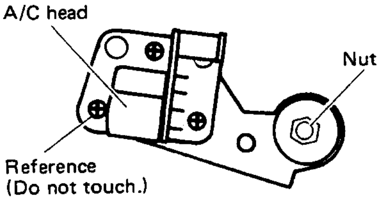

A/C head
Nut
Reference
(Do not touch.)

Fig. 2-8

2.5.5 Removing of center pulley

1. Remove $\boxed{1}\boxed{1}$ S/S board. (See 1.1.)
2. Disengage the timing belt.
3. Remove the cassette housing. (See 2.5.1.)
4. Remove two screws retaining the center pulley assy.
5. The center pulley can be detached by lifting it up.

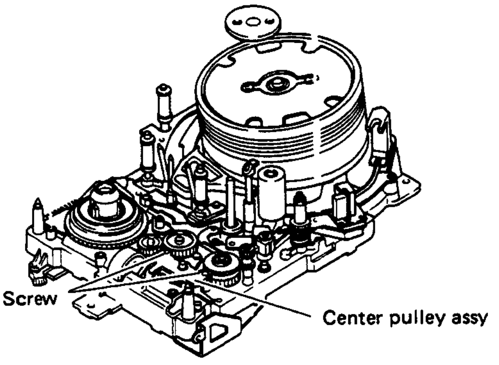

Screw
Center pulley assy

Fig. 2-9

2.5.6 Removing of loading motor

Note: For reinstalling the loading motor, refer to the description of the mechanism phase checkup and adjustment of Section 2.6.

1. Remove $\boxed{0}\boxed{1}$ S/S board. (See 1.1.)
2. Remove $\boxed{3}\boxed{4}$ LED board.
3. Remove slit washers (PQM30017-25, -27) retaining the eject gear and eject lever assy,y to remove them.
4. Remove two screws and slit washer (PQM30017-25) retaining the gear box F assy.
5. Disengage the timing belt and pull the gear box F assy outward.
6. Remove two screws retaining the loading motor assy, and then the loading motor assy can be removed.

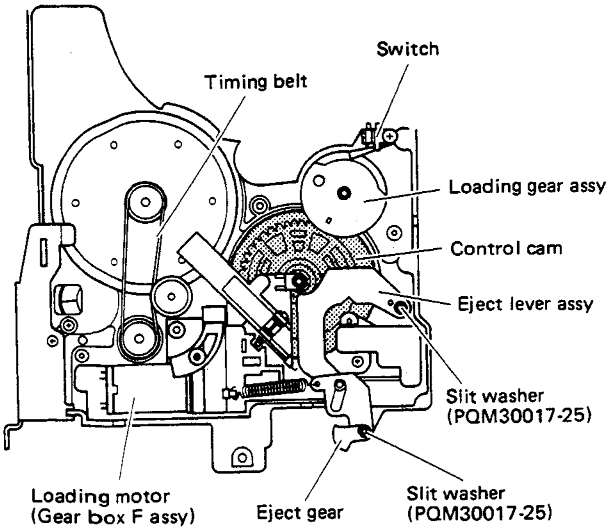

Switch
Timing belt
Loading gear assy
Control cam
Eject lever assy
Slit washer
(PQM30017-25)
Loading motor
(Gear box F assy)
Eject gear
Slit washer
(PQM30017-25)

Fig. 2-10

2.5.7 Removing of loading gear assy

Note: For reinstalling the loading gear assy, refer to Section 2.6 Mechanism phase checkup and adjustment.

1. Remove $\boxed{0}\boxed{1}$ S/S board. (See 1.1.)
2. Remove a slit washer (PQM30017-25) retaining the loading gear assy.
3. With careful attention to the switch, gently draw out the loading gear assy.

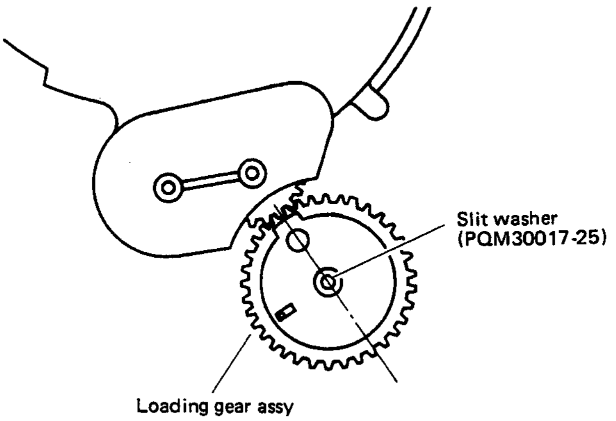

Slit washer
(PQM30017-25)
Loading gear assy

Fig. 2-11

2.5.8 Removing of drum assy

Note: The drum assy must be replaced as a unit consisting of the upper drum and lower drum.
If the upper drum or the lower drum is individually replaced, it causes deterioration in S-N ratio, difference in FM waveforms of respective channels, and other troubles.

1. Remove 0 1 S/S board. (See 1.1.)
2. Remove the shield plate (secured by a screw).

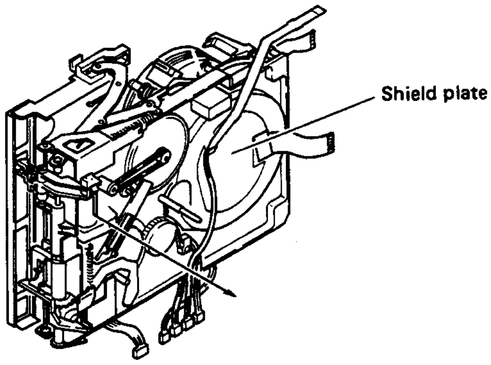


Fig. 2-12

3. Remove three screws retaining the drum assy and draw it upward to remove it.
4. Carefully install a new drum assy (lower drum motor assy) not to damage it in the reverse order of the disassembling. Tighten screws evenly.

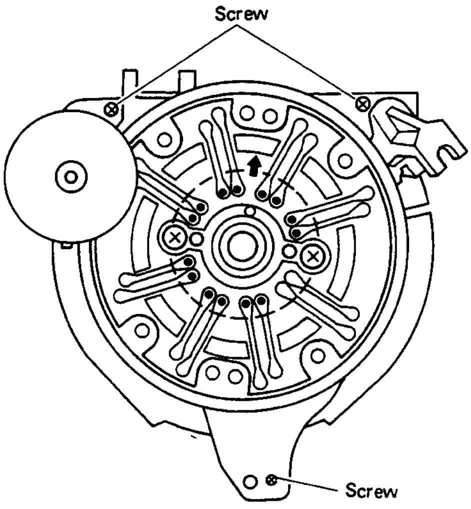


Fig. 2-13

5. After replacement is completed, perform the following checkup and adjustment.
1) Adjustment and checkup of the tape transport system. (See 2.8.)
2) Adjustment of PB color level (See 3.4, No. 12.)
3) Adjustment of REC/PB frequency response (See 3.4, No. 15.)

2.5.9 Removing of brush

1. Remove the drum assy. (See 2.5.8.)
2. Remove a screw retaining the brush to detach it.

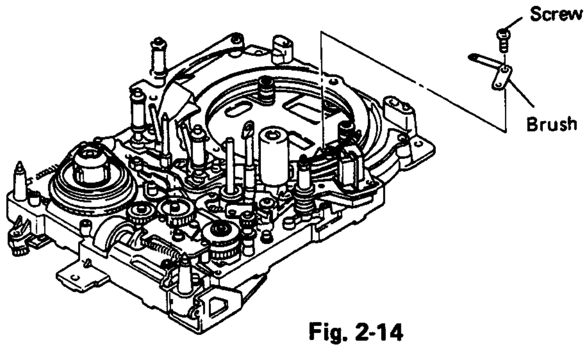


Fig. 2-14

2.5.10 Removing of control cam

Note: For reinstalling the control cam, refer to Section 2.6 Mechanism phase checkup and adjustment.

1. Remove the loading motor. (See 2.5.6.)
2. Remove the loading gear assy. (See 2.5.7.)
3. Draw the control cam out of the shaft.

2.5.11 Setting the mechanism to Loading mode without cassette tape

1. Apply the power to the VTR connected. (See 1.2.)
2. Shut out light to the LED attached to the drum assy with a cap, etc.
3. Pull the pawl Ⓐ in the direction of the arrow so slightly as the cassette housing does not enter the eject mode.

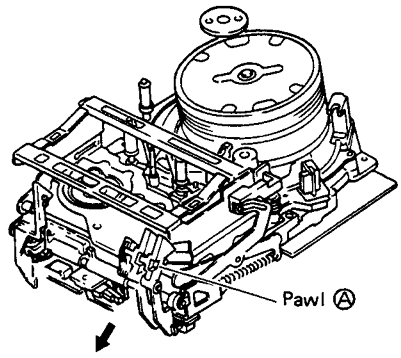


Fig. 2-15

4. After a few seconds, the upper drum starts rotation and loading operation takes place.
5. After the loading operation finishes, turn off the POWER switch.

2.5.12 Removing of the pinch roller arm assy

1. Set the mechanism to the loading mode without a cassette tape. (See 2.5.11.)
2. Remove the cassette housing. (See 2.5.1.)
3. Remove the A/C head. (See 2.5.4.)
4. Remove three slit washers (PQM30017-23, -27).
5. Remove the head arm lever assy and draw the pinch roller arm assy upwards.

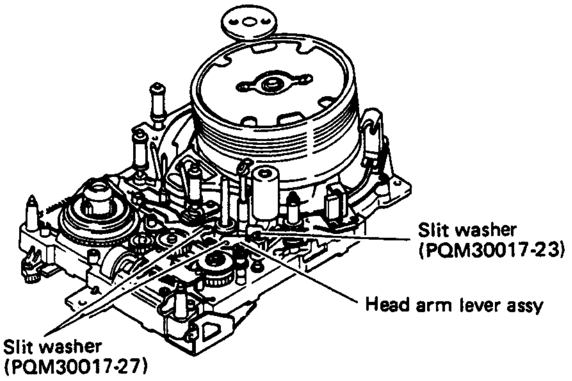

Slit washer
(PQM30017-23)
Head arm lever assy
Slit washer
(PQM30017-27)

Fig. 2-16

6. After reassembling the pinch roller arm assy, check up and adjust the tape transport mechanism. (See 2.8.)

2.5.13 Removing of capstan motor

1. Remove a screw Ⓐ.
2. Set the mechanism to loading mode without a cassette tape. (See 2.5.11.)
3. Remove the cassette housing. (See 2.5.1.)
4. Remove two screws Ⓑ.
5. Disengage the timing belt.
6. Remove the loading motor assy. (See 2.5.6.)
7. Remove the screw retaining 03 AUDIO board.
8. Remove the screw retaining the capstan motor board.
9. Draw the capstan motor assy out of the mechanism to remove it.

Note: For reassembling the parts, refer to Section 2.6 Mechanism phase checkup and adjustment.

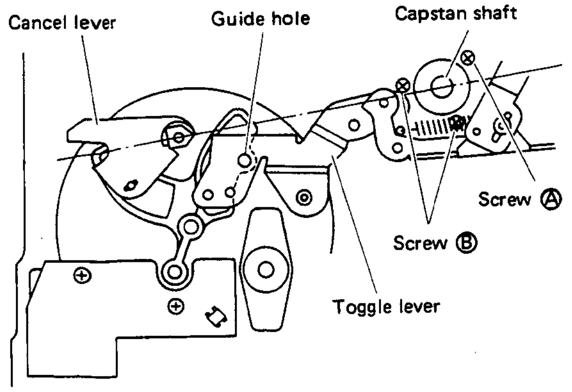

Cancel lever
Guide hole
Capstan shaft
Screw Ⓐ
Screw Ⓑ
Toggle lever

Fig. 2-17

2.5.14 Removing of take-up clutch

1. Detach the cassette housing. (See 2.5.1.)
2. Remove the take-up reel gear (retained by a slit washer).

Note: When removing the take-up reel gear, be careful not to scatter spacers, etc. by the force of the spring.

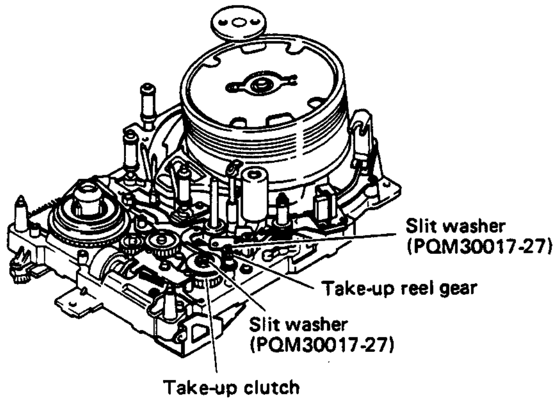

Slit washer
(PQM30017-27)
Take-up reel gear
Slit washer
(PQM30017-27)
Take-up clutch

Fig. 2-18

3. Remove a slit washer (PQM30017-27) retaining the take-up clutch.
4. Pull out the take-up clutch upwards.
5. After reassembling the take-up clutch, check up and adjust the back tension.

2.6 MECHANISM PHASE CHECKUP AND ADJUSTMENT

Note: When removing and reinstalling the mechanism parts, make sure to perform correct phase adjustment of the items 2.6.1 to 2.6.6, because if any item is incorrectly adjusted, the mechanism does not operate normally.

2.6.1 Phase adjustment of loading ring and loading idler gear

1. Set the take-up loading ring and supply loading ring so that their holes coincide with the positioning hole of the lower part of the deck, and insert a thin stick (3 mm dia. such as a precision screwdriver) through the holes to fix the positions. Do not remove the stick until the positioning of the item 2.6.4 is completed.
2. Adjust the phase of the loading idler gear-1 and -2 as shown in Fig. 2-19.

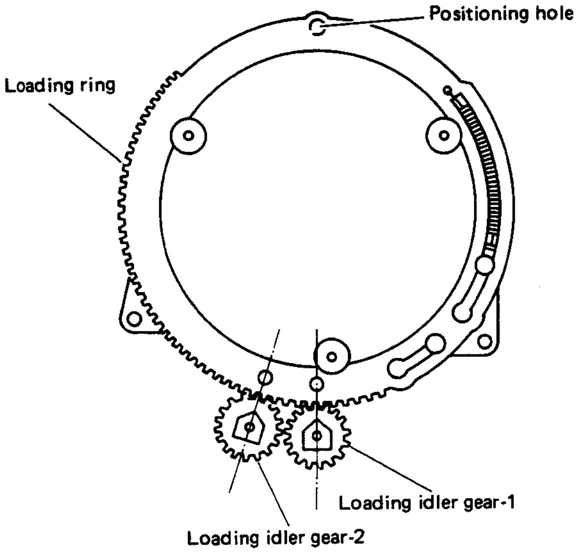

Positioning hole
Loading ring
Loading idler gear-1
Loading idler gear-2

Fig. 2-19

2.6.2 Position of control cam

1. As the control cam is fixed to the gear box, coincide the hole with the lower hole of the deck.

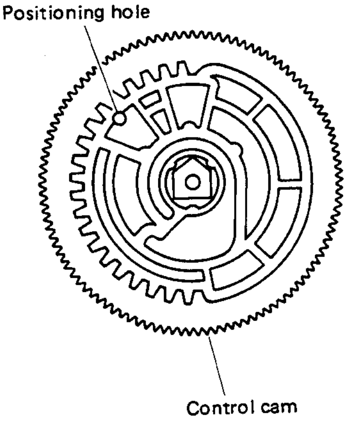

Positioning hole
Control cam

Fig. 2-20

2.6.3 Phase of loading gear assy and control cam

1. Assemble the loading gear assy so that the center of its positioning hole is aligned with the center of the portion Ⓐ of the chassis in a straight line.

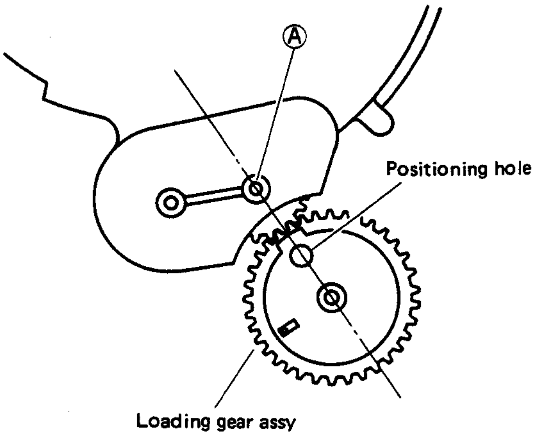

Ⓐ
Positioning hole
Loading gear assy

Fig. 2-21

2.6.4 Correlative position of toggle lever and cancel lever

1. Set the toggle lever so that its hole aligns with the positioning hole of the deck.
2. Set the cancel lever as shown in Fig. 2-22.

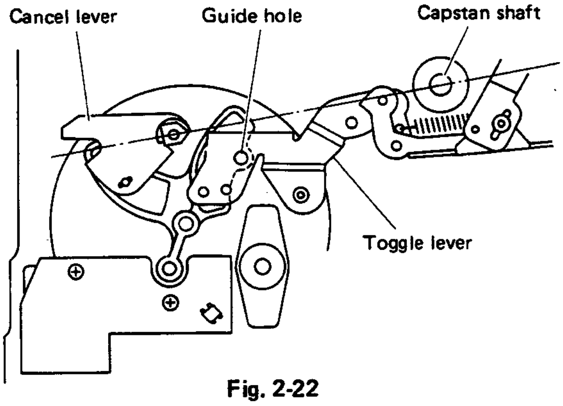

Cancel lever
Guide hole
Capstan shaft
Toggle lever

Fig. 2-22

2.6.5 Position of timing belt

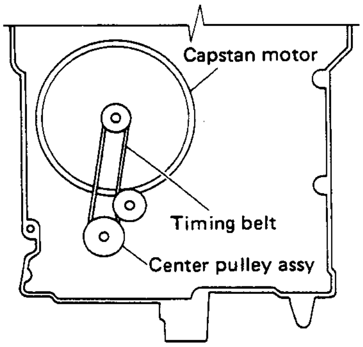

Capstan motor
Timing belt
Center pulley assy

Fig. 2-23

2.6.6 Terms to set eject gear assy (See Fig. 2.5.)

1. The cassette housing has been reassembled and it is closed.
2. The eject lever is pushed toward the drum.

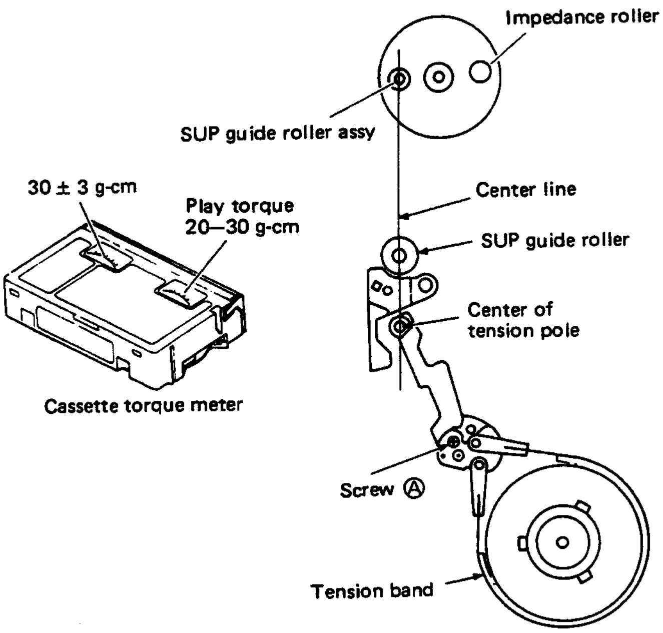
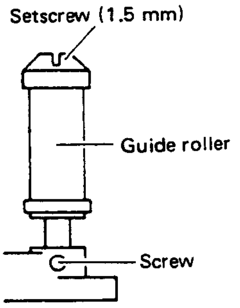
2.7 REGULATOR CIRCUIT

Note: Apply a supply voltage of 12.0 ± 0.1 V DC.

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
1	REG. 8 V	TP203 [S/S PWB] ↓ Digital voltmeter	R226 [S/S PWB] TP203 : 8 ± 0.1 V DC	–	REC	1) Connect a digital voltmeter between TP-203 and GND (battery's minus terminal). 2) Adjust R226 so that voltage at TP203 is 8 V DC.
		TP204 [S/S PWB] ↓ Digital voltmeter	– TP204 : 5.25 ± 0.08 V DC	–	REC	3) Confirm that voltage at TP204 is 5.25 ± 0.08 V DC.
		CN6 pin 12 [S/S PWB] ↓ Digital voltmeter	– CN6 pin 12 : 5.2 ± 0.3 V DC	–	STOP	4) Confirm that voltage at pin 12 of CN6 is 5.2 ± 0.3 V DC.

2.8 TAPE TRANSPORT MECHANISM (Interchangeability and Servo Adjustment)

Note:
- The tape transport mechanism generally has no need of adjustment since it has precisely adjusted at the factory. Therefore, checkup and adjustment described in the following are required only when there is something abnormal in this system and after replacement of component parts.
- When an alignment tape is used, make sure to perform recording and playback with a blank tape to confirm that the tape is not damaged by the operation.

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
1	Back tension	Cassette torque meter  Impedance roller SUP guide roller assy 30 ± 3 g-cm Play torque 20–30 g-cm Center line SUP guide roller Center of tension pole Cassette torque meter Screw Ⓐ Tension band **Fig. 2-8-1** Correlative position of tention pole and impedance roller	Screw Ⓐ	–	PB	1) Use a cassette torque meter to confirm that back tension of the supply side is 30 ± 3 g-cm in playback. 2) If not, loosen the screw Ⓐ to change the tension of the tension band and again tighten the screw Ⓐ so that the back tension is 30 ± 3 g-cm. 3) Play the beginning portion of a E-C30 tape, and confirm that the tension pole and the supply guide roller as well as the center of respective shafts of the supply guide roller assy are aligned on a straight line. **Note:** • Confirm that the tension pole does not contact the chassis at the beginning of the tape as well as the impedance roller rotates at the end of the tape. • If either result of the step 1) and 2) is unsatisfactory, replace the tension band. • When there is a large difference in the values measured by the cassette torque meter, replace the supply reel disk. 4) Confirm that the cassette torque meter reads 20–30 g-cm as the play torque of the take-up side. **Note:** • When the pointer of the cassette torque meter shakes, reads its center value. • When there is something abnormal in the tape take-up side (tape damage, abnormal sound, etc.), replace the take-up clutch assy.
2	Tape pattern	 **Fig. 2-8-2** Guide roller				**Note:** For adjusting tape pattern, slightly loosen screws located in the lower side of the supply guide pole and the take-up guide pole respectively so that the guide poles lightly turn. (To loosen the screw of the supply side, take off the left side cover, while take off the top cover to loosen the screw of the take-up side.) Do not loosen them too much. After adjustment, make sure to tighten the screws, and check up the tape pattern again since the height of the guide rollers may change in this procedure.
		TP502 [Y/C PWB] TP11 (D. FF) [Y/C PWB]	SUP/TU guide roller	MHPE-C or MH-C2	PB	1) Observe waveform at TP502 with external trigger from TP11. 2) With the alignment taoe (stairstep signal) being played, maximize the FM waveform by the tracking button.

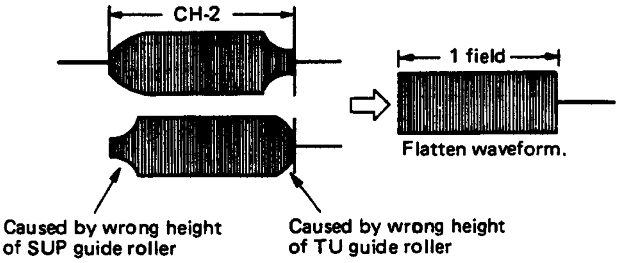
<table>
<tr><th>No.</th><th>Item</th><th>Check Point</th><th>Adjustment Parts</th><th>Signal</th><th>Mode</th><th>Description</th></tr>
<tr><td></td><td colspan="5">

CH-2
1 field
Flatten waveform.
Caused by wrong height of SUP guide roller
Caused by wrong height of TU guide roller

Fig. 2-8-3 FM waveform (1)

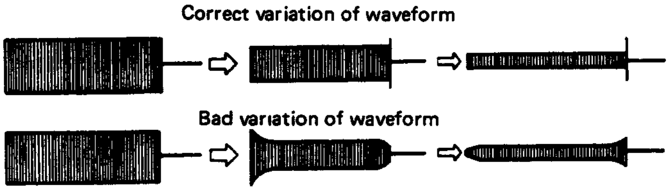

Correct variation of waveform
Bad variation of waveform

Fig. 2-8-4 FM waveform (2)

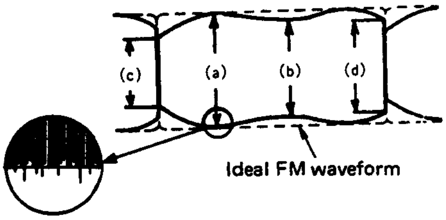

(c)
(a)
(b)
(d)
Ideal FM waveform

Fig. 2-8-5 FM waveform (maximum output)

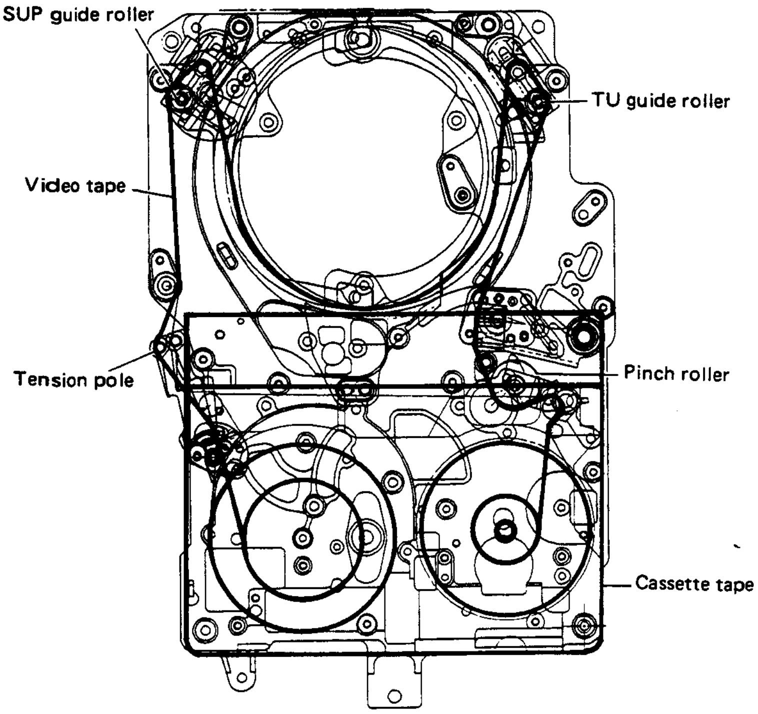
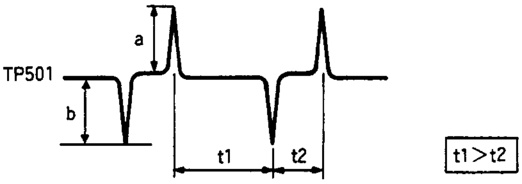
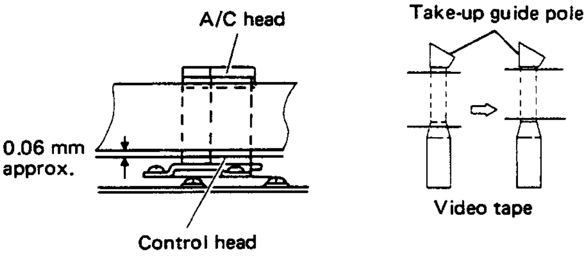
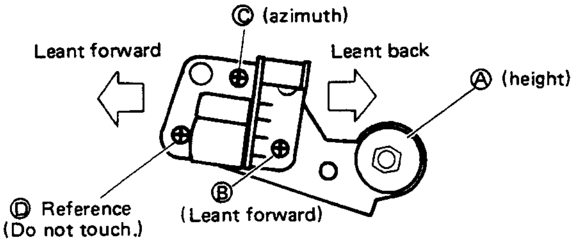
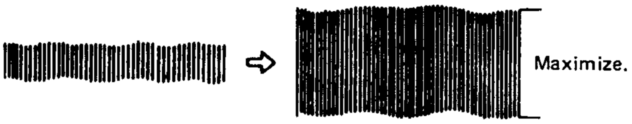
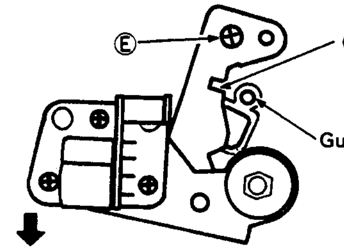
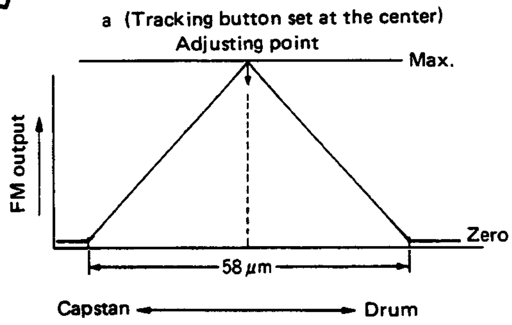
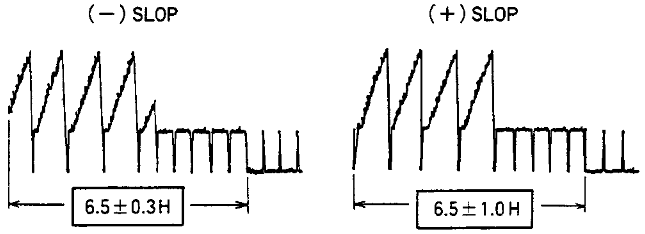
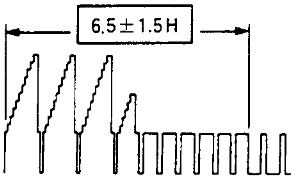

SUP guide roller
TU guide roller
Video tape
Tension pole
Pinch roller
Cassette tape

Fig. 2-8-6 Tape transport system
</td><td>3) If the observed FM waveform is not flat, adjust the supply and take-up guide rollers with a 1.5 mm hex. wrench to obtain a flat waveform.
Note: Slowly turn the guide rollers not to damage the tape.
4) By operating the tracking button (in the + and – directions), vary the FM wave output slowly from the maximum to the minimum and vice versa to confirm flat variation of the FM waveform.
5) When the FM waveform breaks in the process of the level variation, fine adjust the height of the guide rollers so that the FM waveform varies as flat as possible.
Repeat the steps 4) and 5) several times to make the FM waveform for the best result.
6) Take out the loaded tape once and set it again to repeat the checkup since the guide rollers may move in the above adjustment process.
7) Also inspect wrinkling/damage in the tape around the impedance roller and take-up guide pole in loading and unloading, search rewind and when mode changes from search rewind to play.
When there is wrinkling or damage in the tape around the take-up guide pole, adjust the slant (contact) of the audio/control head to the tape so that the tape correctly runs along the lower flange of the guide pole.
8) Play the stairstep signal of the alignment tape.
Note: When the waveform is a sawtooth one, read the output level at a point where the sawteeth are comparatively even.
9) Maximize the output of the FM waveform by turning the tracking control.
10) Set the maximum level of the FM waveform for 4 scale divisions of the oscilloscope.
11) Confirm that FM dropout is more than 3.2 scale divisions both at the tape inlet (c) and tape outlet (d) of the drum.
12) Confirm that variation of the FM waveform is more than 3.6 scale divisions at (b), (c) and (d) points.
13) Turning the tracking control from the clockwisemost position to the counterclockwisemost position and vice versa, confirm that the FM waveform varies nearly straight.</td></tr>
</table>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
3	A/C head height, slant & azimuth	**Note:** • This item requires the most precise adjustment. If it is inaccurately done, it causes difference in audio levels of L and R channels when a recorded tape is played back by an editor, etc. It is the first condition to adjust it for the best and maximum result (PB audio level must be 1.0 Vp-p or more). • For adjustment of the A/C head, it needs to remove the cassette lid and the tape damage protection sheet attached to the take-up guide pole (the cap of the take-up guide pole can be removed by lifting it up). When loading a cassette tape in such the condition, make sure to take in the slack of the tape to prevent it from damage. • If the cassette lid cannot be reassembled as it was, carefully keep it in a cassette case to avoid tape damage and dropout.				
		TP501 [S/S PWB] AUDIO OUT  **Fig. 2-8-7** CTL signal  A/C head Take-up guide pole 0.06 mm approx. Video tape Control head **Fig. 2-8-8** Tape height  Ⓒ (azimuth) Leant forward Leant back Ⓐ (height) Ⓓ Reference (Do not touch.) Ⓑ (Leant forward) **Fig. 2-8-9** A/C head  **Fig. 2-8-10** Audio signal	A/C head	MHPE-C or MH-C2	PB	1) Adjust the nut Ⓐ to obtain the maximum outputs (a, b) at TP501. (height adjustment) **Note:** After all adjustments are completed lock the nut Ⓐ with screw sealant etc. (to avoid change in the A/C head height owing to loading and unloading operations). 2) Play back a prerecorded tape. 3) Adjust the screw Ⓑ to lean the A/C head so as not to wrinkle the tape at the lower flange of the take-up guide pole. (slant adjustment) 4) Play the stairstep signal of the alignment tape (7 kHz) and observe the audio output. 5) Set the AUDIO OUT switch to "NORM". 6) Adjust the screw Ⓒ to obtain the maximum audio output. (azimuth adjustment) 7) Finally confirm no wrinkling in the tape at the take-up guide pole, and adjust Ⓐ, Ⓑ and Ⓒ to maximize the audio output and to minimize the level fluctuation. (Max. audio output : 1.1 Vp-p approx.) 8) Confirm that output at TP501 is maximum.

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
4	A/C head phase (X value)	TP502 [Y/C PWB] TP11 (D. FF) [Y/C PWB]	A/C head	MHPE-C or MH-C2		1) Play the stairstep signal of the alignment and observe the waveform at TP502 with external trigger (+) form TP11. 2) Vary FM level by the tracking button and confirm that the FM output level is maximum as the tracking button is set to the center position. 3) If necessary, slightly loosen the screw Ⓔ of the A/C head and insert the tips of the A/C head positioning tool into the groove and the guide hole, and then move the A/C head toward the capstan. Next, gradually move the A/C head toward the drum to find the point "a" at which the FM output is maximized. At this position, fix the A/C head with the screw Ⓔ.
	 **Fig. 2-8-11** Phase of CTL head  **Fig. 2-8-12** Phase adjustment of CTL head					
5	PB switching point	VTR OUT TP11 (D. FF) [Y/C PWB]	R7 [S/S PWB]	MHPE-C or MH-C2	PB	1) Connect the external trigger terminal to TP11 (D. FF). 2) Set the oscilloscope for minus (—) slope. 3) Adjust R7 so that trigger point is 6.5H before V. sync. **Note:** Confirm that the FM waveform is maximum with the tracking button set at the center position. 4) Change the oscilloscope setting for plus (+) slope. 5) Confirm that trigger point is 6.5H ± 1.0H before V. sync.
			–	Color bar	REC	6) Set the oscilloscope for minus (—) slope again. 7) Confirm that trigger point is 6.5H ± 1.5H before V. sync.
						
6	Vertical jitter	VTR OUT ↓ TV monitor	R215 [S/S PWB]	Color bar	REC ↓ PB ↓ Still	1) Play back a prerecorded tape and change the mode to Still by the STILL button. 2) Adjust R215 to minimize vertical jitter in the Still mode.

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
7	Video & FM audio track phase difference	TP502 [Y/C PWB] TP16 [AUDIO PWB]	–	MHAFE-1C	PB	1) Connect the oscilloscope's CH-1 probe to TP16 of the AUDIO board while CH-2 probe to TP502 of the Y/C board. 2) Play the stairstep portion and the FM audio carrier only portion of the alignment tape (MHAFE-1C). 3) Turn the tracking VR to maximize the audio FM envelope and set the waveform for 4 scale divisions of the oscilloscope. 4) Next, turn the tracking VR to maximize the video FM envelope and confirm that the audio FM envelope is 3.6 scale divisions at that time. (Compare respective maximum levels with each other.)
8	REC/PB FM level fluctuation & FM dropout	TP502 [Y/C PWB] TP16 [AUDIO PWB]	–	Stair step	REC ↓ PB	1) Supply gray scale signal according to the section 1.4 while no input signal in the FM audio. 2) Turn the tracking VR to maximize the output waveform at respective test points and set the maximum level of the waveform for 4 scale divisions. 3) Confirm that FM level fluctuation and FM dropout are as shown in the table on the left. 4) When such the waveform as mentioned above cannot be acquired, there is a problem in the drum and it needs consideration of replacement. **Note:** Use a new tape without no damage for the checkup.

Item	Check Point	Mode/Tape	FM level	FM dropout
FM Video	Y/C TP502	VHS	within 3.6 div.	within 3.4 div.
FM Video	Y/C TP502	S-VHS	within 3.6 div.	within 3.4 div.
FM Audio	AUDIO TP16	S-VHS	within 3.4 div.	within 2.4 div.

- **Final inspection**

1. Confirm no damage, wrinkling, up/down fluctuation in the tape and tape running at the heads, shafts and rollers of the tape transport mechanism in playing the tape.
2. Record the stairstep signal and play it back to confirm that the playback FM waveform is similar to the playback waveform of the alignment tape.
3. Observe FM waveforms with an oscilloscope as the set is placed horizontally and vertically, and set the maximum waveform for 4 scale divisions to confirm that the level is more than 3.8 scale divisions when the set is placed in the other way.
   Confirm the above items 1 and 2 in the two setting positions.
4. Perform checkup and adjustment of the audio circuit. (See Sect. 3.3.)
5. Perform checkup and adjustment of the video circuit. (See Sect. 3.4.)

SECTION 3
ELECTRICAL ADJUSTMENTS

3.1 PRECAUTIONS

1. Preparatory check
   Electrical adjustments described in this section are principally performed after replacement of consumptive mechanism parts and video heads or in case of a fault in the electrical circuits.
   Therefore, it is the first condition that the objective item or part does not meet the specified value.
2. For electrical adjustment of an item or a parr that needs correct mechanical adjustment beforehand, make sure to check up that its mechanical adjustment is correctly performed.
3. All inspections and adjustments of this set must be carried out as all the circuit boards are practically installed.
4. Do not turn off the power switch without reason. If it is done, it may cause damage to tape.
5. When any warning message is displayed, turn off the power switch once and remove the cause before proceeding to do the work.
6. Unless otherwise indicated, inspections and adjustments must be performed as the camera's switches are set to respective initial setting positions as shown below.

Name of Switch	Mode	Name of Switch	Mode
S-VHS switch	ON/AUTO	Hi-Fi ALC switch	OFF
MODE switch	BARS	MIC switch	MONO

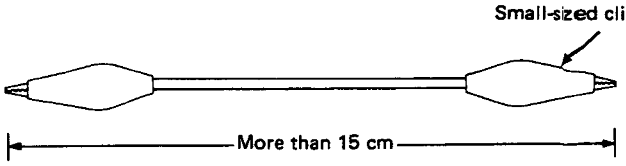
Note: When any of the above initial settings is changed as directed, reset it each time inspection/adjustment of the item finishes.

Note: Before proceeding to electrical adjustment, set a connected VTR into operative state referring to Sections 1.2 and 1.3.

3.2 REQUIRED TEST INSTRUMENTS AND TOOLS

1. To perform electrical adjustments properly and easily, the special test equipment and devices shown in Fig. 3-1 are necessary. When adjustments are performed without them, it takes a long with repeated trial and error, moreover, the results will be unsatisfactory in precision and performance.
2. Besides the above special equipment, the following test instruments are necessitated.
   - Frequency counter (sensitive to over 10 MHz and under 100 mV with high input impedance)
   - Video signal generator (TG-7/2, Model 1411, 410P-3VC or equivalent)
   - Waveform monitor (1458R or equivalent)
   - Digital voltmeter (readable to 1 mV DC)
   - Sweep generator (100 kHz to 10 MHz)
   - Oscilloscope (dual-trace type, for more than 50 MHz)
   - TV monitor
   - Vectorscope (521A or equivalent)
   - Audio tester
3. Additional device for convenience
   - Shorting lead

   This is convenient for shorting test pins.



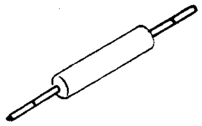
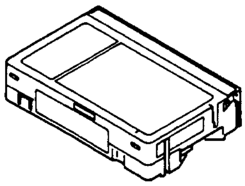
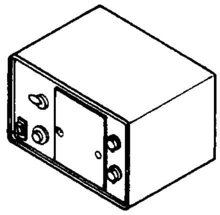
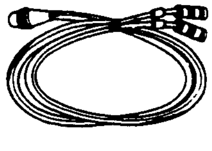
Adjusting jig for compact VTR	Alignment tape	Carrier checker	DUB OUT cable
YTU93004-2	MHPE-C, MHVE-2C, MHVE-2HC, MHAFE-1C	PGJ05008-2	PGJ05018
			

Fig. 3-1 Special test equipment

3.2.1 Contents of alignment tapes

- MHPE-C

Video signal	Audio signal	Application	Remark
VHS SP mode Stairstep signal	6 kHz	• for checkup and inspection of interchangeability • for adjustment of PB switching point	MH-C2 stairstep signal is substitutable.

- MHVE-2C

Video signal	Audio signal	Application	Remark
VHS SP mode Color bar signal	–	• for checkup and adjustment video PB circuit	MH-C2 color bar signal is substitutable.

- MHAFE-1C

Video signal	Audio signal	Application	Remark
Stairstep signal	1 kHz (±50 kHz dev.)	• for checkup and adjustment of FM audio PB circuit	–

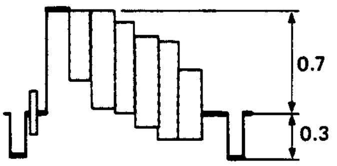
- MHVE-2HC

Video signal	Audio signal	Application	Remark
S-VHS SP mode Color bar signal	–	• for checkup and adjustment of video PB circuit	MH-C2H SP mode color bar signal is substitutable.

Note: The above alignment tapes will be provided by JVC Service Parts Center by request.

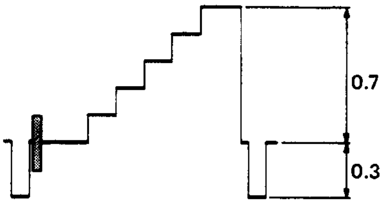
3.2.2 Signals necessary for video system adjustment

1. Color bar signal (EBU 75%)

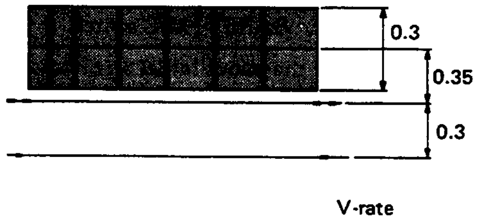


To be used for Y/C level adjustment.
Set the camera's MODE switch to "BARS" position since the color bar signal contained in the camera.
The internal color bar signal must of course be correctly adjusted.

2. Stairstep signal

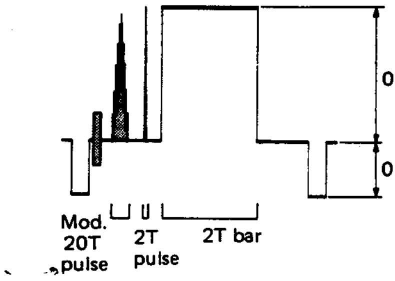


3. Video sweep signal (100 kHz to 5 MHz)



To be used for frequency response adjustment.

4. Pulse and bar signals

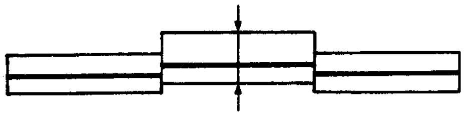


3.3 AUDIO CIRCUIT

Note:
- Unless otherwise indicated, all check points and adjustment parts are located on the AUDIO board.
- For check points without direction of connection, connect them to an audio level meter.
- 0 dBs = 0.775 Vrms = 2.19 Vp-p
- Supply −60 dB, 1 kHz input signal tthrough the external microphone connector (XLR 3 pins) of the camera head.

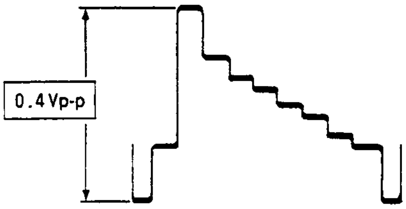
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
1	Audio bias level	TP11 TP12 (GND) TP11 : 2.4 ± 0.4 mVrms (VHS) 3.3 ± 0.3 mVrms (S-VHS)	R9	Non signal	REC VHS REC S-VHS	1) Adjust R9 to obtain 2.4 mVrms output at TP11. 2) Confirm that output at TP11 is 3.3 ± 0.3 mVrms.
2	Audio E-E level	AUDIO OUT AUDIO OUT : −6.0 ± 2.0 dBs	–	1 kHz/+4 dBs	E-E	1) Change the initial setting as follows. AUDIO SELECT SW : NORM 2) Confirm that output level at the AUDIO OUT terminals (L and R channels) is −6.0 ± 2.0 dBs respectively.
3	Hi-Fi audio volume margin	AUDIO OUT	–	1 kHz/+4 dBs	E-E	1) Change the initial setting as follows. AUDIO SELECT SW : Hi-Fi 2) Turn the AUD REC LEVEL volume full clockwise. 3) In the above condition, confirm that output level on L ch and R ch is more than 0 dB respectively. 4) Turn the Hi-Fi REC LEVEL volume to adjust the output level to −6 dBs.
4	Audio PB level	AUDIO OUT	R28	MHPE-C	PB	1) Change the initial setting as follows. AUDIO SELECT SW : NORM 2) Adjust R28 so that output level at the AUDIO OUT terminals is −6.0 dBs respectively.
5	Audio level meter indication	AUDIO OUT	R40 : L ch R41 : R ch	1 kHz/+4 dBs	E-E	1) Change the initial setting as follows. AUDIO SELECT SW : Hi-Fi 2) Turn the AUD REC LEVEL volume to adjust Hi-Fi output level at the AUDIO OUT terminals to −6.0 dBs respectively. 3) Adjust R40 and R41 so that the AUDIO LEVEL meters of R and L channels point 0 dB respectively.
6	Audio REC/ PB frequency response	AUDIO OUT	(R9)	1 kHz 100 Hz 10 kHz −6 dBS	REC ↓ PB VHS	1) Change the initial setting as follows. AUDIO SELECT SW : NORM 2) Record the 1 kHz, 100 Hz and 10 kHz signals respectively and play them back. 3) Referring to playback level of the 1 kHz signal as the reference (0 dB), confirm that playback levels of the 100 Hz and the 10 kHz signals respectively meet the specified values shown in the left table. 4) When playback level of the 10 kHz signal is out of the specifications, adjust the bias level in a range of 2.4 ± 0.4 mVrms (refer to the Item No. 1).

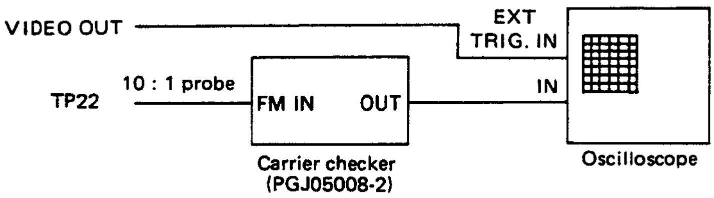
100 Hz	1 kHz	10 kHz
0^{+3}_{-6} dB	0 dB (reference)	0 ± 1 dB

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
7	Hi-Fi REC FM level	TP8 ↓ Oscilloscope TP8 : 1.3 ± 0.1 Vp-p 	R69	5th step ↓ VIDEO IN	REC S-VHS	**Note:** Before proceeding to this item, confirm that the item No. 9 of Sect. 3.4 (REC FM level) is correctly adjusted. 1) Set the 20 MHz filter of the oscilloscope to ON. 2) Adjust R69 so that signal level at TP8 is 1.3 Vp-p. **Note:** Perform recording without audio signal input and play it back to confirm that Hi-Fi sound without buzz noise is heard as the monitor's volume is turned up. Depending on the situation, check up REC color level in respective modes.
8	Hi-Fi REC/ PB FM level	TP16 ↓ Oscilloscope	(R69) TP16 : 44 to 50 mVp-p	Non signal	REC ↓ PB VHS	1) Connect the oscilloscope's EXT trigger terminal to TP14 of the Y/C board. 2) Confirm that output at TP16 is 44 to 50 mVp-p. 3) If the level is out of the specified value, adjust R69 (see the Item No. 7). **Note:** • When there is level difference by channel, confirm it with the smaller level. (Also confirm that the larger level is less than 80 mVp-p.) • Set the larger level for 5.0 scale divisions on the oscilloscope, and confirm that the smaller level is more than 3.2 scale divisions. (Level difference must be less than 4 dB.)
			– TP16 : more than 44 mVp-p		REC ↓ PB S-VHS	4) Confirm that output level at TP16 is more than 44 mVp-p. **Note:** • When there is level difference by channel, confirm it with the smaller level. (Also confirm that the larger level is less than 80 mVp-p.) • Set the larger level for 5.0 scale divisions on the oscilloscope, and confirm that the smaller level is more than 3.2 scale divisions. (Level difference must be less than 4 dB.)

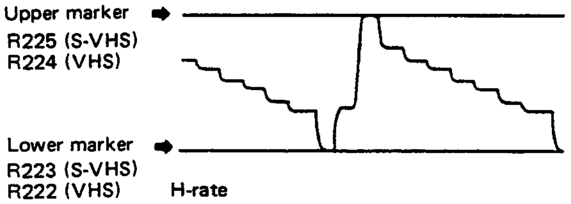
3.4 VIDEO CIRCUIT

Note:
- Make sure to adjust the video circuit 5 minutes or more after the power is turned on.
- Unless otherwise indicated, all check points and adjustment parts are located on the Y/C board.
- Items with S-VHS indication must be adjusted/inspected with the S-VHS SW set to ON/AUTO (OFF for VHS indication).
- Use SE-C30 cassette tape as an S-VHS tape (use E-C30 as a VHS tape).

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
1	EE VIDEO OUT level	VTR OUT (75 ohms terminated) Y level : 1 ± 0.05 Vp-p Burst level : 0.3 Vp-p	R237 (Y) R317 (Burst)	Color bar	E-E S-VHS	1) Connect an oscilloscope to the VTR OUT terminal. 2) Adjust R237 so that Y level is 1 Vp-p. 3) Adjust R317 so that burst level is 0.3 Vp-p. (Oscilloscope set to DC mode)
2	EE Y/C OUT level	Y/C 443 OUT (75 ohms terminated) Y level : 1 ± 0.05 Vp-p Burst level : 0.3 Vp-p	VR3 (Y) [IF PWB] VR1 (C) [IF PWB]	Color bar	E-E S-VHS	1) Connect an oscilloscope to the Y/C443 Y OUT terminal. 2) Adjust R157 so that the output level is 1 Vp-p. 3) Connect the oscilloscope to tye Y/C443 C OUT terminal. 4) Adjust R139 so that the burst level is 0.3 Vp-p. (Oscilloscope set to DC mode)
3	EE return Y level	TP1 (IF PWB) (75 ohms terminatel) Y level : 1 ± 0.1 Vp-p	–	Color bar	E-E S-VHS	1) Confirm that the output level is 1 ± 0.1 Vp-p.
4	REC process input level	TP26  	R313	Color bar	REC S-VHS	1) Adjust R313 to obtain 0.4 Vp-p as the level at TP26.

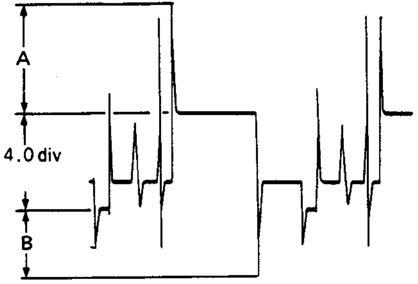
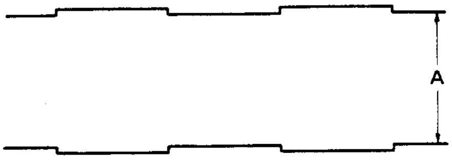
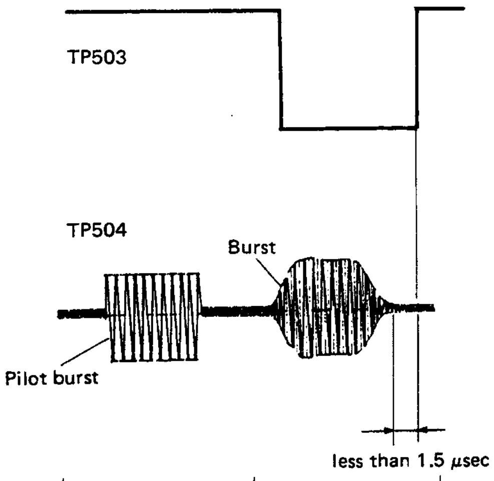
<table>
<tr><th>No.</th><th>Item</th><th>Check Point</th><th>Adjustment Parts</th><th>Signal</th><th>Mode</th><th>Description</th></tr>
<tr><td>5</td><td>Limiter balance</td><td>TP27
⬇
Digital voltmeter
TP8 : 3.48 ± 0.05 V DC</td><td>R297</td><td>No signal</td><td>REC
S-VHS</td><td>1) Adjust R297 to obtain 3.48 V DC at TP27.</td></tr>
<tr><td>6</td><td>REC process output level</td><td>TP28
TP7 : 0.5 Vp-p</td><td>R316</td><td>Color bar</td><td>REC
S-VHS</td><td>1) Adjust R316 so that the output level is 0.5 Vp-p.</td></tr>
<tr><td>7</td><td>Carrier & deviation</td><td>TP22


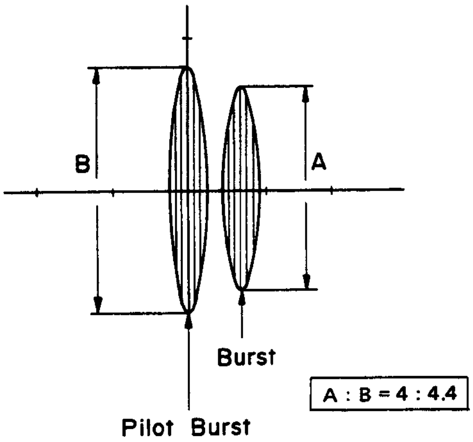
VIDEO OUT
EXT TRIG. IN
10 : 1 probe
TP22
FM IN
OUT
IN
Carrier checker (PGJ05008-2)
Oscilloscope

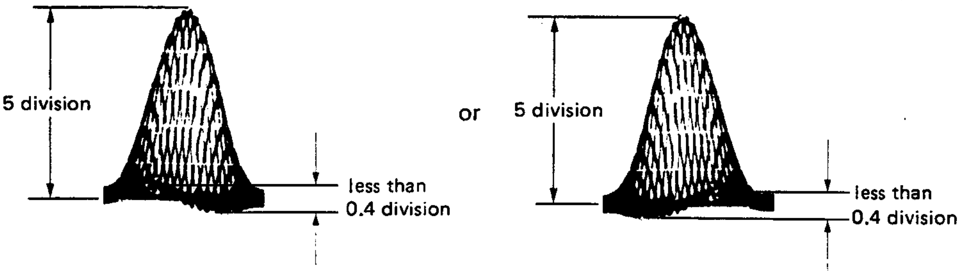


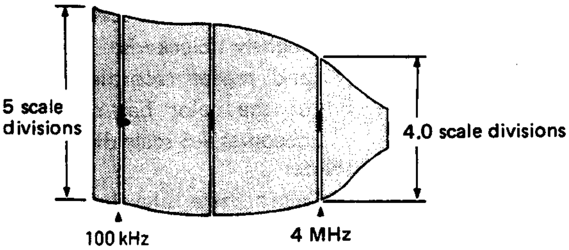
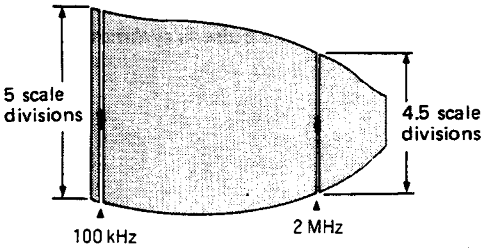
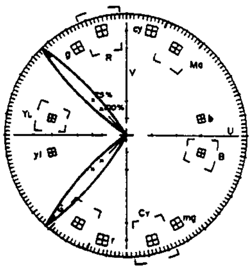
Upper marker
R225 (S-VHS)
R224 (VHS)
Lower marker
R223 (S-VHS)
R222 (VHS)
H-rate

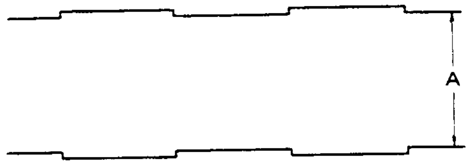
</td><td>R223
R225</td><td>Color bar</td><td>REC
S-VHS</td><td>**Note:** A carrier checker (PGJ05008-2) is required for this adjustment.
1) Connect a carrier checker and an oscilloscope as shown in the left figure.
2) Connect the carrier checker to TP22 and set its switch for S-VHS mode.
3) Set the sync. tip to the lower marker by R223 while set the 100% white portion to the upper marker by R225 (the both must be set together).</td></tr>
<tr><td></td><td></td><td>TP22
<table>
<tr><th rowspan="2">Mode</th><th colspan="2">Carrier</th><th rowspan="2">Deviation</th></tr>
<tr><th>Sync. tip</th><th>100% white</th></tr>
<tr><td>S-VHS</td><td>5.4 MHz</td><td>7.0 MHz</td><td>1.6 MHz</td></tr>
<tr><td>VHS</td><td>3.8 MHz</td><td>4.8 MHz</td><td>1.0 MHz</td></tr>
</table></td><td>R222
R224</td><td>Color bar</td><td>REC
VHS</td><td>4) Connect the carrier checker to TP22 and set its switch for Normal VHS mode.
5) Set the sync. tip to the lower marker by R222 while set the 100% white portion to the upper marker by R224 (the both must be set together).</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Check Point</th><th>Adjustment Parts</th><th>Signal</th><th>Mode</th><th>Description</th></tr>
<tr><td rowspan="3">8</td><td rowspan="3">White &
Dark clip</td><td rowspan="3">TP3
 <table><tr><th>Mode</th><th>A (div)</th><th>Adj. point</th><th>B (div)</th><th>Adj. point</th></tr><tr><td>S-VHS</td><td>4.4</td><td>R244</td><td>2.8</td><td>R248</td></tr><tr><td>VHS</td><td>3.6</td><td>R245</td><td>1.8</td><td>R247</td></tr></table></td><td rowspan="3">R244 : S-VHS
R248 : S-VHS
R245 : VHS
R247 : VHS</td><td rowspan="3">Pulse/Bar
(20T)</td><td>REC
VHS</td><td>1) Observing waveform at TP3, adjust the oscilloscope's gain control to set the level difference between the sync. tip and the 100% white for 4.0 scale divisions on the screen.
2) Also adjust R245 so that the white clip is 3.6 scale divisions (190%) at that time.</td></tr>
<tr><td>REC
S-VHS</td><td>3) In the same manner as the above 1), set the level difference between the sync. tip and the 100% white for 4.0 scale divisions.
4) In the above condition, set the white clip for 4.4 scale divisions (210%) by R244 while set the dark clip for 2.8 scale divisions (70%) by R248.</td></tr>
<tr><td>REC
VHS</td><td>5) In the same manner as the above step 1), set the level difference between the sync. tip and the 100% white for 4.0 scale divisions.
6) Also adjust R247 to set the dark clip for 1.8 scale divisions (45%) at that time.</td></tr>
<tr><td rowspan="3">9</td><td rowspan="3">REC FM
level</td><td rowspan="3">TP4

A : S-VHS = 4.2 Vp-p
VHS = 3.5 Vp-p</td><td rowspan="3">R179 : S-VHS
R168 : VHS</td><td rowspan="3">Color bar</td><td>REC
S-VHS</td><td>1) Connect the oscilloscope's EXT TRIGGER terminal to TP11.
2) Adjust R179 so that pedestal level at TP4 is 4.2 Vp-p.</td></tr>
<tr><td>REC
VHS</td><td>3) Adjust R168 so that pedestal level at TP4 is 3.5 Vp-p.</td></tr>
<tr><td colspan="2">Note: Confirm that the Hi-Fi REC FM level adjustment (3.3 AUDIO circuit, Item No. 7)has been correctly performed.</td></tr>
<tr><td>10</td><td>Burst gate
width</td><td>TP503
TP504
 </td><td>R608</td><td>Color bar</td><td>REC
VHS</td><td>1) Connect CH-1 of a dual-trace oscilloscope to TP503 and CH-2 to TP504.
2) Adjust R608 so that the rising point of TP503's pulse coincides with the end of the end of the Burst signal. (see figure)</td></tr>
</table>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
11	Polot burst level	TP500 	R439	Color bar	REC S-VHS	1) Connect the oscilloscope to TP500. Adjust the oscilloscope to set the burst level to 4.0 scale divisions. 2) Adjust R439 to set the pilot burst level to 4.4 scale divisions (110%).
12	4.43 VXO	TP403 ⬇ Frequency counter TP403 : 4.433619 MHz ± 60 Hz	–	MHVE-2HC	PB	1) Confirm that frequency measured at TP403 is 4.433619 MHz ± 60 Hz.
13	REC color level	TP404	–	MHVE-2C	PB	1) Connect the oscilloscope's EXT TRIGGER terminal to TP11. 2) Adjust the oscilloscope's gain control so that the output level becomes 5.0 scale divisions. **Note:** • When there is level difference by channel, adjust for the channel having the larger level. • In this case confirm that the smaller level is more than 3.6 scale divisions.
			R624	Color bar	REC ⬇ PB VHS	3) Record the color bar signal and play it back. 4) Confirm that the larger output level of channels is 4.5 scale division. 5) When the measured value is smaller (larger) than 4.5 scale division, turn R624 slightly clockwise (counter clockwise) and repeat recording and playing back of the color bar signal (unit the level becomes 4.5 scale division). **Note:** • When there is level difference by channel, adjust for the channel having the larger level. • In this case confilm that the smaller level is more than 3.2 scale division.

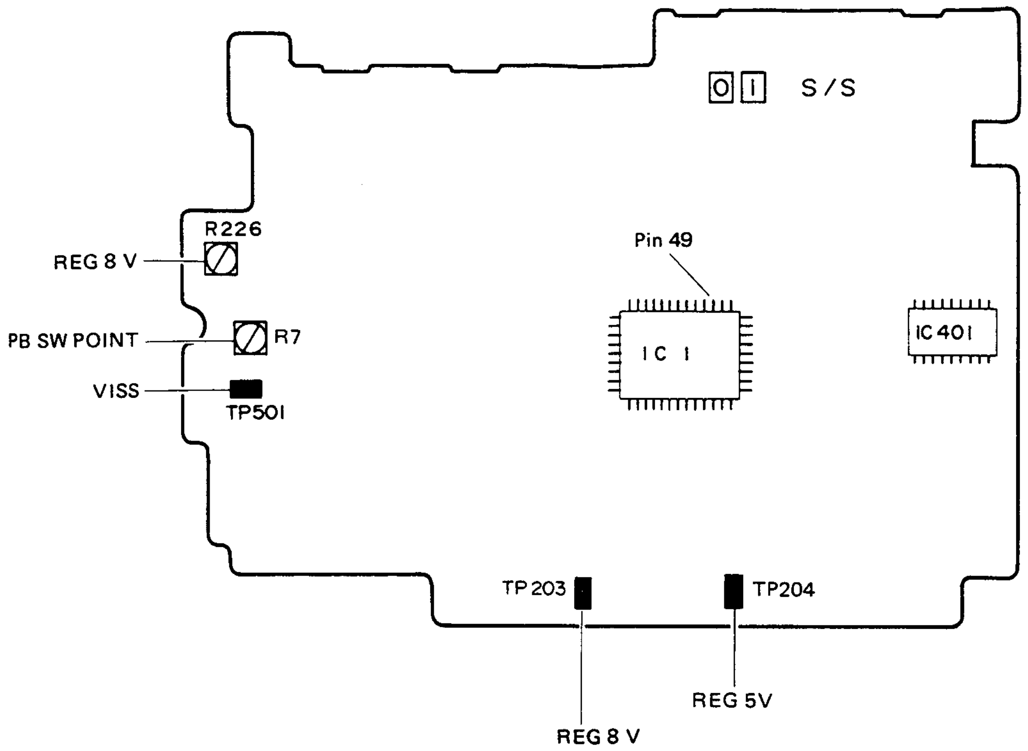
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
		TP404	–	MHVE-2HC	PB	1) Connect the oscilloscope's EXT TRIGGER terminal to TP11. 2) Adjust the oscilloscope's gain control so that the output level becomes 5.0 scale divisions. **Note:** • When there is level difference by channel, adjust for the channel having the lager level. • In this case confirlm that the smaller level is more than 3.6 scale divisions.
			R626	Color bar	REC ↓ PB S-VHS	3) Record the color bar signal and play it back. 4) Confirm that the larger output level of channels is 5.9 scale division. 5) When the measured value is smaller (larger) than 5.9 scale division, turn R626 slightly clockwise (counter clockwise) and repeat recording and playing back of the color bar signal (until the level becomes 4.5 scale division). **Note:** • When there is level difference by channel, adjust for the channel having the larger level. • In this case confilm that the smaller level is more than 3.2 scale division.
14	REC Y/C delay	TP30 ⌉ ADD TP501⌋ mode	R622	Pulse & bar (20T)	REC ↓ PB VHS	1) Connect an oscilloscope to TP30 and TP501, and set the oscilloscope to the ADD mode. 2) Adjust R622 so that the base of the mod. 20T pulse is symmetrical.
						
		TP26 ⌉ ADD TP500⌋ mode	R616	Pulse & bar (20T)	REC ↓ PB S-VHS	1) Connect an oscilloscope to TP26 and TP500, and set the oscilloscope to the ADD mode. 2) Adjust R616 so that the base of the mod. 20T pulse is symmetrical.
15	CCD bias & output levels	TP29	R104	Color bar	REC ↓ PB S-VHS	1) Connect the oscilloscope's EXT TRIGGER terminal to TP11. 2) Record the color bar signal and play it back. 3) Alternately adjust R104 to minimize the level at TP29.

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
16	REC/PB VIDEO OUT level	VTR OUT (75 ohms terminated)	R201 Y level : 1 ± 0.05 Vp-p	Color bar	REC ↓ PB S-VHS	1) Connect the oscilloscope to the VTR OUT terminal. 2) Adjust R201 so that Y level is 1 Vp-p.
			R200 Y level : 1 ± 0.05 Vp-p	Color bar	REC ↓ PB VHS	3) With the oscilloscope connected to the VIDEO OUT terminal, adjust R200 to obtain 1 Vp-p as the output level.
17	REC/PB frequency response	Y/C443 Y OUT (75 ohms terminated)	R262  5 scale divisions 4.0 scale divisions 100 kHz 4 MHz	Sweep signal ↓ Y/C443 Y IN	REC ↓ PB S-VHS	1) Record the sweep signal and play it back. 2) Connect the oscilloscope's EXT TRIGGER terminal to TP11. 3) Adjust the oscilloscope's gain control to set the 100 kHz level of waveform observed at the Y/C443 Y OUT for 5.0 scale divisions, and adjust R262 so that the 4 MHz level becomes 4 scale divisions. (−2 dB) **Note:** • Adjust for the both channels to meet the specifications. • In this case, confirm that the smaller level is more than 3.2 scale divisions (−2 dB) referring to the lager level which is 4.0 scale division.
			R278  5 scale divisions 4.5 scale divisions 100 kHz 2 MHz	Sweep signal ↓ Y/C443 Y IN	REC ↓ PB VHS	4) In the same manner as the above steps 1) through 3), adjust R278 so that the 2 MHz level becomes 4.5 scale division. **Note:** • When there is level difference by channel, adjust for the channel having the larger level. • Set the larger level for 4.5 scale divisions, and confirm that the smaller level is more than 3.6 scale divisions. (Level difference must be within 2 dB.) • In this case, confirm that the 3 MHz level is more than 1.3 to 2.2 scale divisions −12 to −7 dB.
18	REC/PB color level	VTR OUT (75 ohms terminated) ↓ Vectorscope	R649 	color bar	REC ↓ PB S-VHS	1) Record the color bars signal and play it back. 2) With input of the reference colour bars signal (EBU75%) to a vectorscope, adjust the vectorscope's GAIN control so that burst level crosses the scope's circumference. 3) Change the input signal to the vectorscope from the reference color bars signal to PB signal from the VTR OUT. 4) Adjust R649 to equalize level of the liminous point of the burst signal with the level of the reference color bars signal.

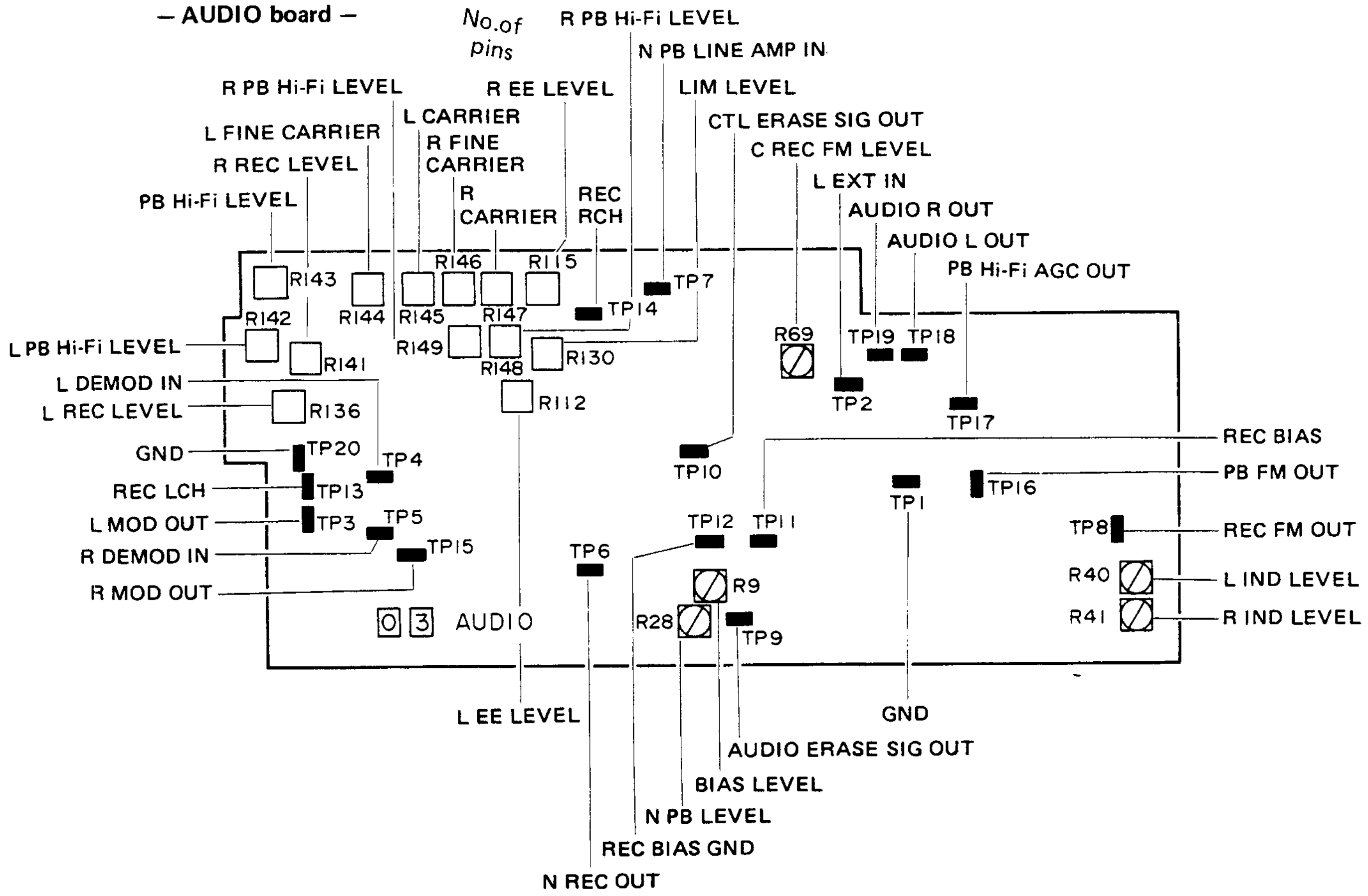
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description
19	PB FM level	TP502	–	Color bar	REC ⬇ PB S-VHS	1) Connect the oscilloscope's EXT TRIG-REG terminal to TP11. 2) Confirm that output level at TP502 is more than 1.0 Vp-p.
		 A : S-VHS = more than 1.0 Vp-p VHS = more than 0.6 Vp-p			REC ⬇ PB VHS	3) Confrim Ithat output level at TP502 is more than 0.6 Vp-p.

- **LOCATION OF TEST POINTS AND VRs**

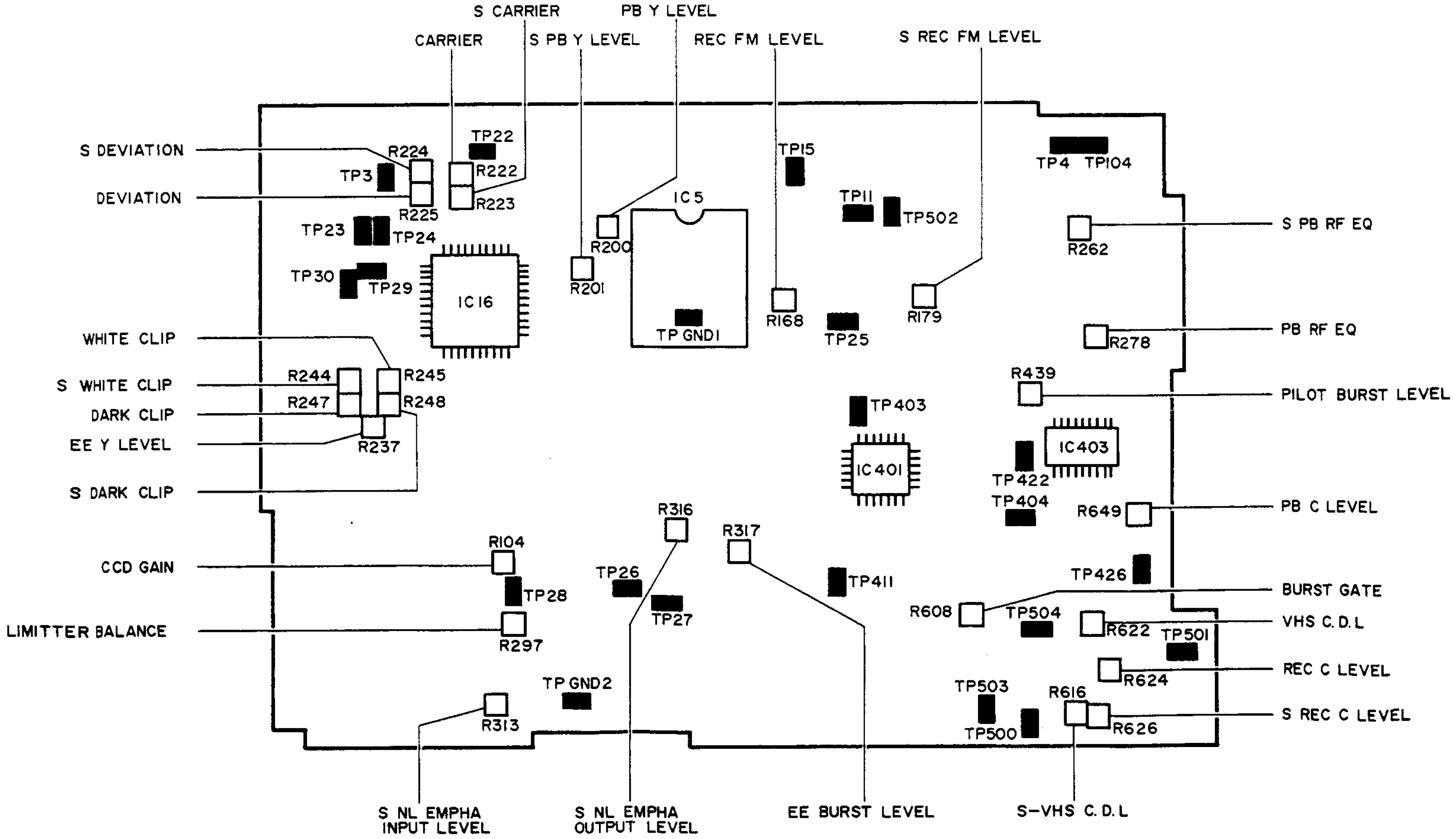
– S/S board –


01 S/S
R226
REG 8 V
Pin 49
IC 1
IC401
PB SW POINT
R7
VISS
TP501
TP203
TP204
REG 5V
REG 8 V

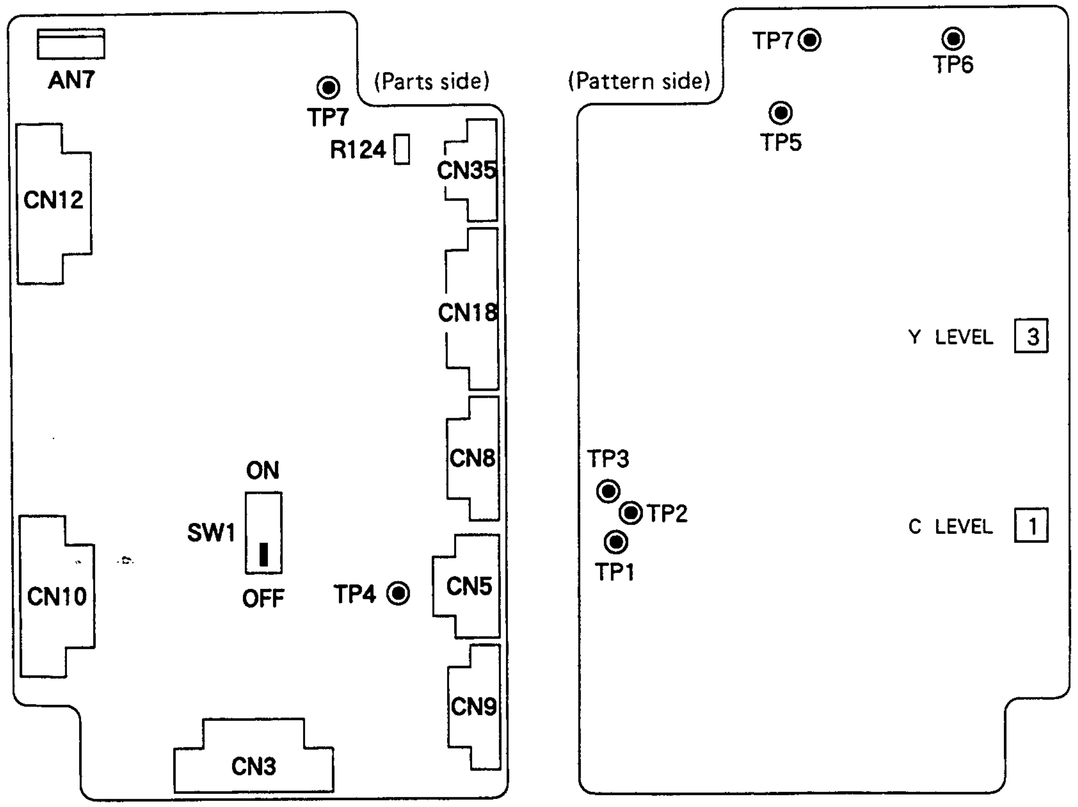
– AUDIO board –


No.of pins
R PB Hi-Fi LEVEL
N PB LINE AMP IN
R PB Hi-Fi LEVEL
R EE LEVEL
LIM LEVEL
L CARRIER
CTL ERASE SIG OUT
L FINE CARRIER
R FINE CARRIER
C REC FM LEVEL
R REC LEVEL
L EXT IN
R CARRIER
REC RCH
AUDIO R OUT
PB Hi-Fi LEVEL
AUDIO L OUT
PB Hi-Fi AGC OUT
R146
R115
R143
TP7
R144
R145
R147
TP14
R142
R69
TP19
TP18
L PB Hi-Fi LEVEL
R149
R148
R130
R141
TP2
TP17
L DEMOD IN
R112
L REC LEVEL
R136
GND
TP20
TP4
TP10
REC BIAS
PB FM OUT
TP16
REC LCH
TP13
TP1
L MOD OUT
TP3
TP5
TP12
TP11
TP8
REC FM OUT
R DEMOD IN
TP15
TP6
R9
R40
L IND LEVEL
R MOD OUT
R28
R41
R IND LEVEL
03 AUDIO
TP9
L EE LEVEL
GND
AUDIO ERASE SIG OUT
BIAS LEVEL
N PB LEVEL
REC BIAS GND
N REC OUT

– Y/C board –


S CARRIER
PB Y LEVEL
CARRIER
S PB Y LEVEL
REC FM LEVEL
S REC FM LEVEL
S DEVIATION
R224
TP22
TP15
TP4
TP104
TP3
R222
DEVIATION
R223
IC5
TP11
TP502
R225
S PB RF EQ
TP23
TP24
R200
R262
TP30
TP29
IC16
R201
R168
TP25
R179
TP GND1
PB RF EQ
WHITE CLIP
R278
R244
R245
R439
S WHITE CLIP
R247
R248
PILOT BURST LEVEL
DARK CLIP
TP403
EE Y LEVEL
R237
IC401
IC403
TP422
S DARK CLIP
TP404
R649
PB C LEVEL
R316
R317
R104
CCD GAIN
TP26
TP426
TP28
TP411
BURST GATE
TP27
R608
TP504
R622
TP501
VHS C.D.L
LIMITTER BALANCE
R297
REC C LEVEL
R624
TP GND2
TP503
R616
R313
TP500
R626
S REC C LEVEL
S NL EMPHA INPUT LEVEL
S NL EMPHA OUTPUT LEVEL
EE BURST LEVEL
S-VHS C.D.L

– IF board –


AN7
(Parts side)
TP7
R124
CN35
CN12
CN18
ON
SW1
OFF
CN8
TP4
CN5
CN10
CN9
CN3
(Pattern side)
TP7
TP6
TP5
Y LEVEL 3
TP3
TP2
TP1
C LEVEL 1

SECTION 4
DIAGRAMS AND CIRCUIT BOARDS

4.1 FORWORD

4.1.1 Signal flow on the diagram

The following arrow marks indicate the specified signal paths respectively.

1. Y/C, PRE AMP, AUDIO and AV MAIN circuits

➡ : RECORDING or EE SIGNAL PATH
⇨ : PLAY BACK SIGNAL PATH
➨ : REC/PLAY SIGNAL PATH

2. S/S circuit

➡ : DRUM SERVO
⇨ : CAPSTAN SERVO

4.1.2 Measurement of voltage and waveform

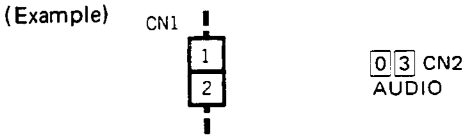
1) Voltage
   Measured by digital voltmeter in SP/Hi-Fi REC mode.
   Value in ( ) shows voltage in S-VHS PB mode, and it is indicated only in the case PB voltage is different from that in REC.
2) Waveform
   Video: Unless otherwise indicated, (a) color bars signal input through LINE IN terminal in REC in S-VHS mode, (b) color bars signal of MHVE-2HC (MH-C2H) alignment tape in PB.
   Audio: (a) 1 KHz/+4 dBs sine wave in REC, (b) 1 kHz segment of alignment tape in PB.

4.1.3 Unit of value

Unless otherwise specified:
1) Resistance is in Ω (1/6 W, 1/8 W)
2) Capacitance in μF
3) Inductance in μH
4) Screened parts (in ▨) are important for safety assurance. When replacing them, use specified parts.

4.1.4 Wiring of connector

(Example)



In the above example, CN1 is connected with CN2 on 0 3 AUDIO board.

4.1.5 Definition of the surface and the back of circuit board diagrams

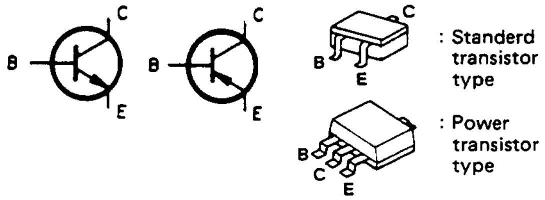
Front: Side on which discrete parts are assembled
Rear: Side on which chip parts are assembled

4.2 REPLACING SUBMINIATURE "CHIP" PARTS

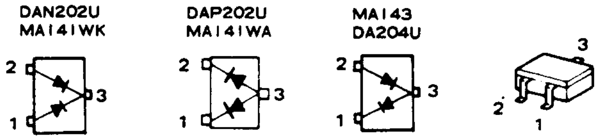
1. Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
2. Additional compactness is achieved by using subminiature chip parts for certain circuit elements. When replacing these parts, note the cautions outlined below.

   Chip transistors and diodes used in this model are outlined as follows.

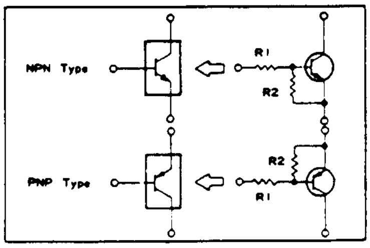
- **Chip transistor**



- **Chip diode**



- **Digital transistor**

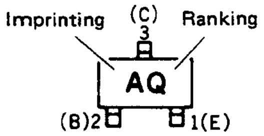
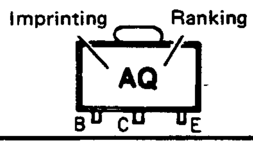
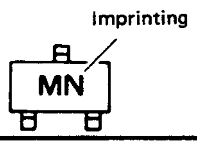


RESISTOR VALUES

JUNCTION	Part No.	R1 (kΩ)	R2 (kΩ)
PNP	DTA144EK	47	47
	DTA124E	22	22
	DTA124EU	22	22
NPN	DTC144EK	47	47
	DTC144EU	47	47
	DTC124EK	22	22
	DTC124EU	22	22

Note: The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

- **Chip transistor and chip diode imprinting**

Transistors				Diodes	
Type	**Imprinting**	**Type**	**Imprinting**	**Type**	**Imprinting**
DTA114EU	14	2SB1073(PQ)	1P, 1Q	DAN202K	N
DTA124EK	15	2SB1132(QR)	BAQB, BARB	DAN202U	N
DTA124EU	15	2SB1218(QR)	AQ, AR	DAP202K	P
DTA143ZK	E13	2SB4098(PQ)	AP, AQ	DAP202U	P
DTA144EK	16	2SB624	BV1–BV5	DA204K	K
DTA144EU	16	2SB798	DK–DM	DA204U	K
DTC124EK	25	2SC2412K(QR)	BQ, BR	FMN1	N1
DTC124EU	25	2SC3931(CD)	UC, UD	IMN10	N10
DTC124TU	05	2SC3936(BC)	KB, KC	MA141A	MA
DTC143TU	03	2SC4081	BQ–BS	MA141WA	MN
DTC144EK	26	2SC4097(QR)	CQ, CR	MA141WK	MT
DTC144EU	26	2SC4098(PQ)	AP, AQ	MA704	MIK
DTC144WK	86	2SC4116(G)	LG	RD7.5M-T2B2	7.52
2SA1037K(QR)	FQ, FR	2SC4181	L17, L18		
2SA1502	HL	2SD1819	YR–YS		
2SA1532(BC)	EB, EC	2SJ146	4D		
2SA1576	FQ–FS	UN5216	8F		
2SA1577 (PQ)	HP, HQ				
					

*Although some P.C. boards are the same as those used in the BR-S420C, S/S board, Y/C board, AUDIO board and IF board are not interchangeable with those of the BR-S420C at all since their parts constant and ROMs are partially different from each other.

Take not that all the P.C. boards are exclusive use of the GY-X1TC and GY-X1.

3. Required tools:
   1) Fine tipped, well insulated soldering "pencil" (with absorbent) (Temp : 130°C ~ 260°C).
   2) Tweezers
   3) Blower type hair dryer.
4. Soldering cautions:
   1) Do not apply heat for more than 3 seconds.
   2) Avoid using a rubbing stroke when soldering.
   3) Discard removed chips; do not reuse them.
   4) Supplementary cementing is not required.
   5) Use care not to scratch or otherwise damage the chips.
5. Soldering conditions:
   1) Resistors, capacitors, etc.

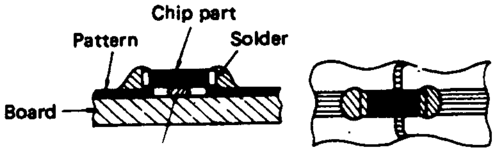


Fig. 4-1

   2) Transistors, diodes, etc.

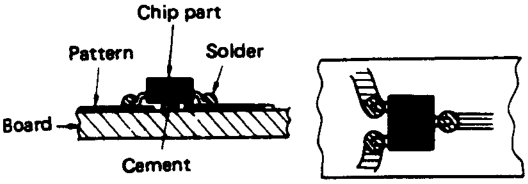


Fig. 4-2

6. Removal (resistors, capacitors, etc.):
   1) Grasp the part with repair jig and melt the solder at one side.

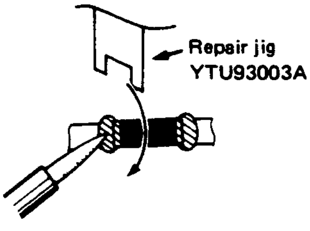


Fig. 4-3

   2) Melt the solder at the other side and remove the part with a twisting motion.

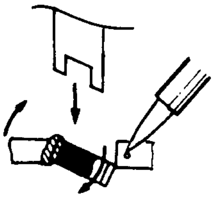


Fig. 4-4

7. Removal (transistors, diodes, etc.):
   1) Melt the solder of one lead.

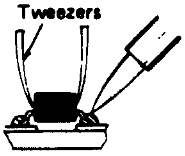


Fig. 4-5

   2) Lift the side of that lead upward.

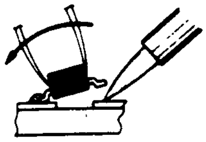


Fig. 4-6

   3) Simultaneously heat solder of the two remaining leads and lift part to remove.

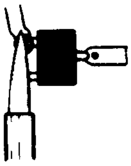


Fig. 4-7

8. Preheating (except for semiconductors):
   Immediately before installing new resistors or capacitors, use a blower type hair dryer and preheat the part for about two minutes at approximately 150°C.

9. Replacement:
   1) Presolder the contact points of the circuit pattern.

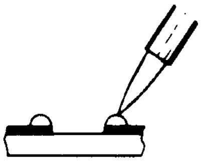


Fig. 4-8

   2) Press the part downward with repair jig and apply the soldering pencil as indicated in the figure.

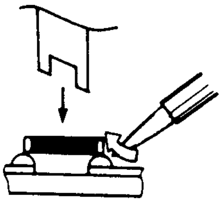


Fig. 4-9

4.3 KEY TO ABBREVIATIONS

A	ACC	: Automatic Color Control
	ADD	: Adder
	ADC	: Analog to Digital Converter
	ADJ	: Adjustment
	A DUB	: Audio Dubbing
	AE	: Audio Erase
	AEF	: Automatic Edition Function
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	: After Loading
	ALC	: Automatic Level Control
	ALM	: Alarm
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Phase Control
	APL	: Average Picture Level
	ASSEM	: Assembly
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUTO	: Automatic
	AUX	: Auxiliary
	AUD	: Audio
B	B	: Brake
	BAL	: Balance
	BATT	: Battery
	BCD	: Binary Coded Decimal
	BEG	: Beginning
	BFP	: Burst Flag Pulse
	BIT	: Binary Digit
	BLK	: Black
	BLU	: Blue
	BNC	: Bayonet connector
	BPF	: Bandpass Filter
	BRN	: Brown
	BRT	: Brightness
	B. SOL	: Brake Solenoid
	B/W	: Black and White
C	C	: Ceramic
	CAP	: Capstan
	CASS	: Cassette
	CF	: Ceramic Filter, color Frame
	CC	: Cassette compartment
	CE	: Chip Enable
	CH	: Channel
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CNT	: Count, Counter
	CONV	: Converter
	COL	: Color
	COM	: Common
	COMP	: Comparator Composite Compensation
	CONN	: Connector
	CT	: Ceramic Trap
	CTC	: Crosstalk Cancel
	CTL	: Control
D	D	: Drum
	DAC	: Dightal to Analog Converter
	DD	: Direct Drive
	DEC	: Decoder
	DEMOD	: Demodulator
	DET	: Detector
	DEV	: Deviation
	DFRS	: Drum Free RUN STOP
	DIF TRANS	: Differential Transformer
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DRUM FF	: Drum Flip Flop
	DUB	: Dubbing
E	E	: Edit, Erase
	EDP	: Electronic Data Processing
	E-E	: Electric to Electric
	EF	: Emitter-Follower
	EMPHA	: Emphasis
	EMG	: Emergency
	ENC	: Encoder
	EN	: Enable
	EQ	: Equalizer
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External
F	FE	: Full Erase
	FF	: Fast Forward Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FMA	: FM Audio
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
G	GDL	: Grass Delay Line
	GEN LOCK	: Generator Lock
	GND	: Ground
	GRN	: Green
	GRY	: Gray
H	H	: High, Horizontal
	HG	: Hall Generator
	HPF	: Highpass Filter

I
IF : Intermediate Frequency
IFT : Intermediate Frequency Transformer
IND : Indicator
INH : Inhibit
INS : Insert
INT : Internal, Interrupt
INV : Inverter
I/O : Input/Output

L
L : Low
LB : Low Band
LCD : Liquid Crystal Display
LE : Loading End
LED : Light Emitting Diode
LIN : Linearity
LIM : Limiter
LOAD : Loading
LP : Long Play
LPF : Lowpass Filter
LT : Loading Tension

M
MAX : Maximum
MDA : Motor Drive Amplifier
MIC : Microphone
MIN : Minimum
MIX : Mixer
MM : Monostable Multivibrator
MOD : Modulator
MON : Monitor
MOS : Metal Oxide Semkonductor
MPX : Multiplexer
MS : Mode Select
MUT : Muting

N
NC : Noise Cancel
NFB : Negative Feedback
NO : Normally Open

O
OPAMP : Operational Amplifier
OP : Operation
ORN : Orange
OSC : Oscillator

P
PB : Playback
PC : Photocoupler
PCM : Pulse Code Modulation
PGM : Program
PG : Pulse Generator
PI : Photo Interrupter
PLL : Phase Locked Loop
POS : Position
PR : Pinch Roller
PREV : Preview
PRL : Preroll
PU : Pickup
PWB : Printed Wiring Board

Q
Q : Quality Factor

R
RA : Resistor Array
: Random Access
RAM : Random Access Memory
REC : Recording
REG : Regulated
REV : Reverse
REW : Rewind
RF : Radio Frequency
RST : Reset
R/P : Record/Playback
RPT : Repeat
RT : Rotary Transformer
RY : Relay

S
S : Search, Servo
SC : Subcarrier
SEAR : Search
SEL : Select
SENS : Sensor
SEP : Separator
SF : Source Follower
SFF : Short Fast Forward
SFWD : Search Forward
SI : Serial In
SIG : Signal
SO : Serial Out
SOL : Solenoid
SOS : Sound on Sound
SP : Standard Play
SR : Supply Reel
SREV : Search Reverse
SREW : Short Rewind
SSG : Sync Signal Generator
STL : Still
SUP : Supply
SYNC : Synchronization
SYSCON : System control

T
TBC : Time Base Corrector
TC : Tension Control, Time Code
TDG : Time Date Generator
T. EALM : Tape End Alarm
TEN : Tension
TIM : Timing
TK : Tracking
TL : Time Lapse
TREC : Timer Record
TSW : Time Switch
TU : Take-up
TUR : Take-up Reel

U
UNLD : Unloading
UNREG : Unregulated
UNSW : Unswitched

V
V : Video, Vertical
VCO : Voltage Controlled Oscillator
VD : Vertical Drive
VXO : Variable Crystal Oscillator
VLT : Violet
VSCH : Variable Search

W
WHT : White
WV : Working Voltage
WARN : Warning

X
XTL : Crystal

Y
Y : Luminance
YLW : Yellow

4.4 LIST OF SEMICONDUCTORS WITH SHAPES

	NAME	L
	IC	
A	AFZ72F30A5	1D
	AN2276S	5D
	AN2510S	6C
	AN2570FA	2B
	AN3380NK	5C
	AN3931NC	4A
	AN3977C	4E
	AN6308S	1A
	AN6392	3B
	AN78L08-TA	2F
B	BA10324F	1B
	BA10339F	1B
	BA10358F	1B
	BA10393F	1B
	BA7131F	1A
	BU4001BF	1B
	BU4011BF	1B
	BU4052BF	3D
	BU4053BF	3D
	BU4081BF	3D
H	HA11899MP	4C
	H8D7091B	3E
I	IR3F01N	1A
M	MC8180B	1E
	MN3106S	1A
	MN3801S	3C
	MSM6830M3	6A
	MSM6984MS	1A
	M37100M8-396FP	1F
	M37405E5	1F
	M37450M2-152FP	1F
	M51798FP	1B
	M52074FP	5E
	M5236ML	3A
	M5282FP	1A
	M54543ASL	5B
	M54641FP	2E
N	NJM2904E	1A
	NJM3404AM	1A
	NJM431U	4B
S	S-3500A2	1B
	S-8053AN0	2A
	S-8054HN	4B
	S-81215AG	4B
	S-81252HG	2A
T	TA7361AP	2C
	TA8609F	1C
	TA8644F	4D
	TA8733F	6C
	TC4S66F	6D
	TC4S69F	6D
	TC4S71F	6D
	TC4S81F	6D
	TC7S04F	6D
	TC74HC04AF	1B
	TC74HC14AF	1B

	NAME	L
U	UPC2370GH	2D
	UPC2371GH	2D
	UPC324G2	1B
	UPC358G2	1A
	UPC393G2	1A
	UPD4011BG	1B
	UPD4053BG	3D
	UPD6147G	6A
	UPD6148GS	6C
	UPD9319CGC	6E
V	VC2031MP	6B
	VC2057	4D
	VC2095	6A
	VC5026G	6A
5V	5VT16	3F
	TRANSISTOR	
D	DTA114EU	1G
	DTA124EK	1G
	DTA124ES	1G
	DTA124EU	1G
	DTA143ZK	1G
	DTA144EK	1G
	DTA144EU	1G
	DTC124EK	1G
	DTC124EU	1G
	DTC124TU	1G
	DTC143TU	1G
	DTC144EK	1G
	DTC144ES	4G
	DTC144EU	1G
	DTC144WK	1G
U	UN5216	1G
2SA	2SA1037K	1G
	2SA1502	1G
	2SA1532	1G
	2SA1576	1G
	2SA1577	1G
2SB	2SB1073	4G
	2SB1132	4G
	2SB1218	1G
	2SB2412K	1G
	2SB624	1G
	2SB766	3G
	2SB798	3G
2SC	2SC2412K	1G
	2SC3931	1G
	2SC3936	1G
	2SC4081	1G
	2SC4097	1G
	2SC4098	1G
	2SC4181	1G
2SD	2SD1819	1G
2SJ	2SJ146	2G

	NAME	L
	DIODE	
D	DAN202K	1H
	DAN202U	1H
	DAP202K	2H
	DAP202U	2H
	DA204K	6H
	DA204U	6H
	DC010	1H
E	ERA15-06	5H
	ERA81-004	4H
	ERA82-004	5H
	ESJA04-02	5H
F	FMN1	2I
I	IMN10	3I
M	MA141A	5H
	MA141WA	2H
	MA141WK	1H
	MA152WK	1H
	MA157A	6H
	MA704	5H
R	RD20EB2	3H
	RD7.5M-T2B2	1I
	RD8.2EBS	3H
L	LN28CAL	4I
	ISS133	5H

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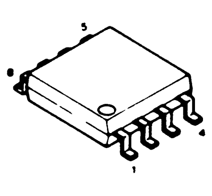
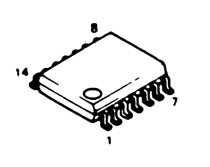
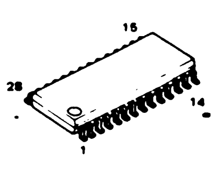
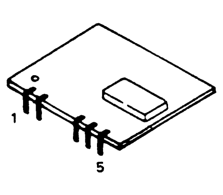
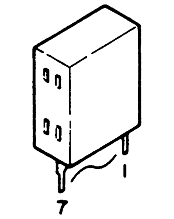
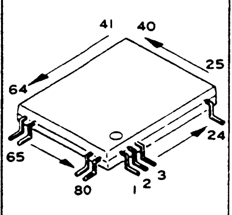
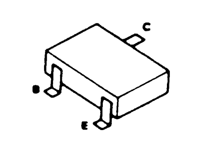
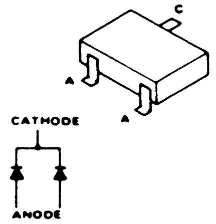
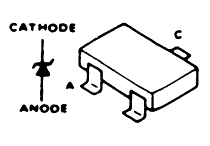
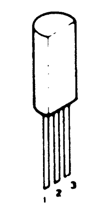
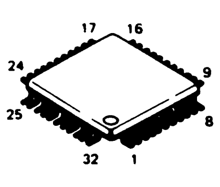
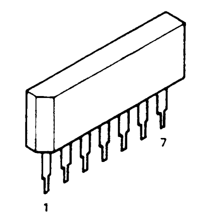
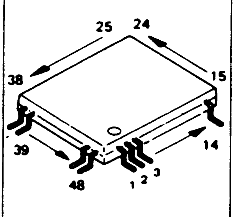
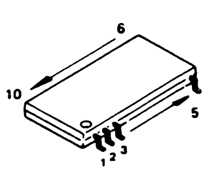
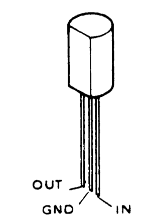
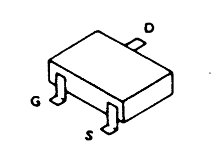
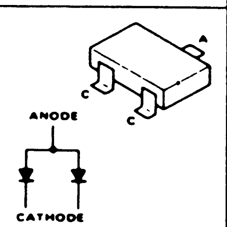
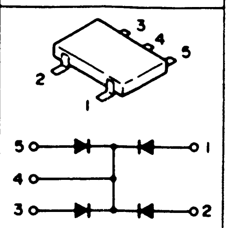
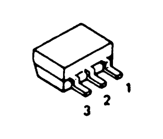
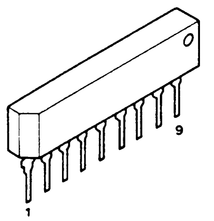
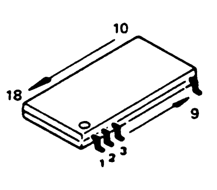
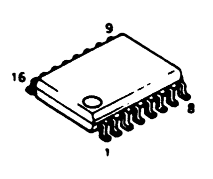
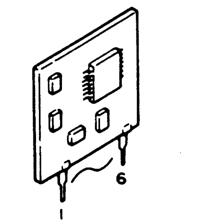
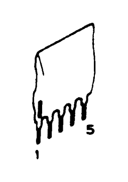
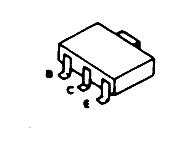
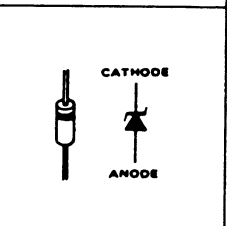
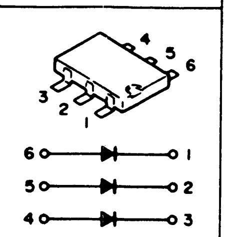
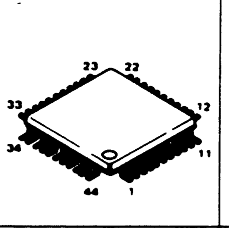
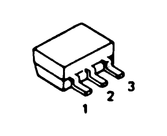
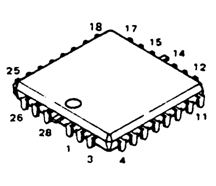
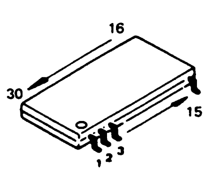
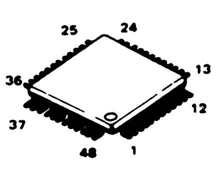
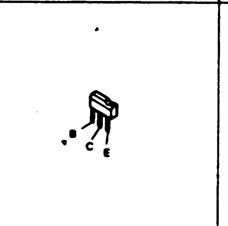
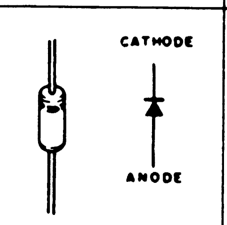
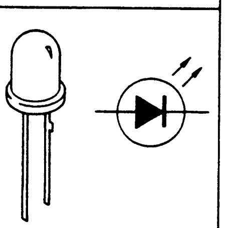
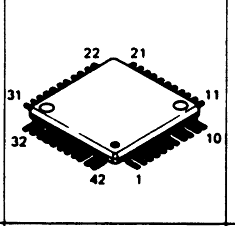
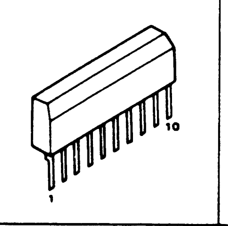
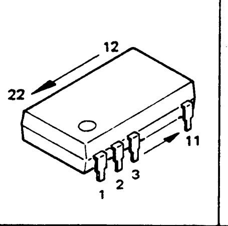
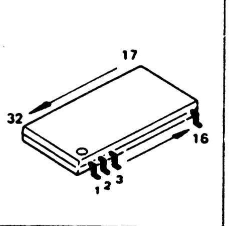
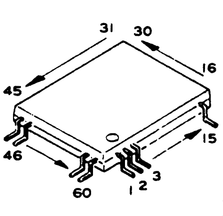
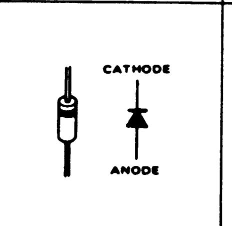
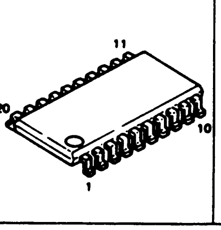
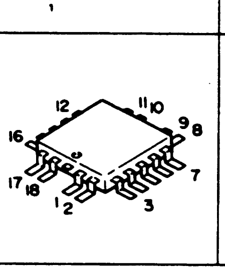
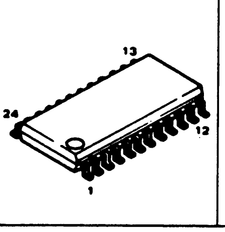
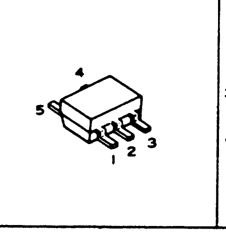
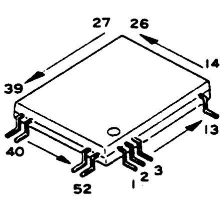
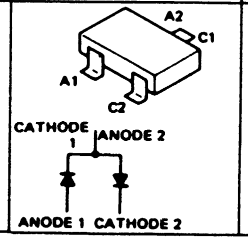
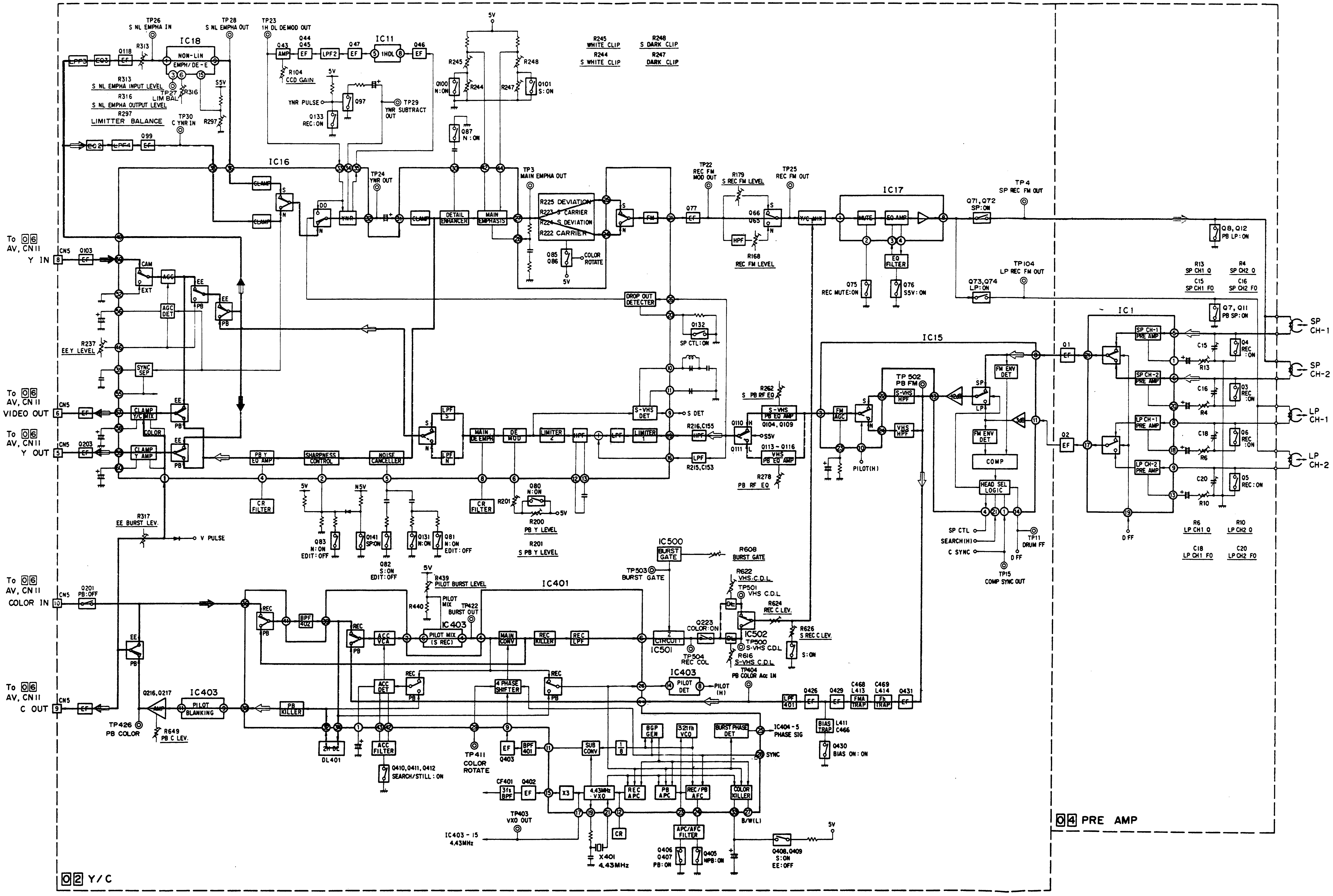
1									
2									
3									
4									
5									
6									

4.5 INDEX TO MAIN CIRCUIT BOARDS

Board No.	Board Name	Page of Diagram		
		Block Diagram	Schematic Diagram	Circuit Board
01	S/S BOARD	4-12	4-13	4-14, 15
02	Y/C BOARD	4-9	4-16, 17	4-18, 19
03	AUDIO BOARD	4-10	4-20	4-21
03	PROT/EP S/N BOARD	–	4-20	4-11
04	PRE AMP BOARD	–	4-22	4-23
06	IF BOARD	–	4-24	4-25
30	UPPER DRUM BOARD	–	4-22	4-23
33	SENSOR BOARD	–	4-26	4-11
34	LED BOARD	–	4-26	4-11

4.6 VIDEO BLOCK DIAGRAM


TP26
S NL EMPHA IN
TP28
S NL EMPHA OUT
TP23
1H DL DEMOD OUT
IC18
NON-LIN
EMPH/DE-E
Q118
R313
LPF3
EQ3
R313
S NL EMPHA INPUT LEVEL
TP27
LIM BAL
R316
S NL EMPHA OUTPUT LEVEL
R297
LIMITTER BALANCE
TP30
C YNR IN
S5V
EQ2
LPF4
Q99
EF
Q43
AMP
Q44
Q45
LPF2
Q47
IC11
1HDL
Q46
R104
CCD GAIN
5V
YNR PULSE
Q97
TP29
YNR SUBTRACT OUT
Q133
REC:ON
IC16
CLAMP
DO
YNR
TP24
YNR OUT
DETAIL ENHANCER
MAIN EMPHASIS
TP3
MAIN EMPHA OUT
R225 DEVIATION
R223 S CARRIER
R224 S DEVIATION
R222 CARRIER
Q85
Q86
COLOR ROTATE
R245
R248
R244
R247
Q100
N:ON
Q101
S:ON
Q87
N:ON
R245
WHITE CLIP
R244
S WHITE CLIP
R248
S DARK CLIP
R247
DARK CLIP
FM
Q77
TP22
REC FM MOD OUT
R179
S REC FM LEVEL
TP25
REC FM OUT
Q66
Q65
HPF
R168
REC FM LEVEL
Y/C MIX
IC17
MUTE
EQ AMP
EQ FILTER
Q75
REC MUTE:ON
Q76
S5V:ON
Q71, Q72
SP:ON
TP4
SP REC FM OUT
TP104
LP REC FM OUT
Q73, Q74
LP:ON
Q8, Q12
PB LP:ON
R13
SP CH1 0
R4
SP CH2 0
C15
SP CH1 F0
C16
SP CH2 F0
Q7, Q11
PB SP:ON
IC1
SP CH-1 PRE AMP
SP CH-2 PRE AMP
LP CH-1 PRE AMP
LP CH-2 PRE AMP
Q4 REC:ON
Q3 REC:ON
Q6 REC:ON
Q5 REC:ON
SP CH-1
SP CH-2
LP CH-1
LP CH-2
Q1
Q2
R6
LP CH1 0
R10
LP CH2 0
C18
LP CH1 F0
C20
LP CH2 F0
D FF
To 06
AV, CN II
Y IN 8
CN5
Q103
CAM
EXT
AGC
EE
PB
AGC DET
R237
EE Y LEVEL
SYNC SEP
DROP OUT DETECTER
Q132
SP CTL:ON
To 06
AV, CN II
VIDEO OUT 6
CLAMP Y/C MIX
COLOR
To 06
AV, CN II
Y OUT 5
Q203
CLAMP Y AMP
PB Y EQ AMP
SHARPNESS CONTROL
NOISE CANCELLER
LPF S
LPF N
MAIN DE EMPH
DE MOD
LIMITER 2
HPF
LPF
LIMITER 1
S-VHS DET
S DET
R216, C155
HPF
LPF
R215, C153
R262
S PB RF EQ
S-VHS PB EQ AMP
Q104, Q109
Q110
Q111
S5V
Q113-Q116
VHS PB EQ AMP
R278
PB RF EQ
IC15
FM AGC
TP 502
PB FM
S-VHS HPF
VHS HPF
PILOT(H)
FM ENV DET
FM ENV DET
COMP
HEAD SEL LOGIC
SP CTL
SEARCH(H)
C SYNC
TP11
DRUM FF
D FF
TP15
COMP SYNC OUT
CR FILTER
5V
N5V
Q83
N:ON
EDIT:OFF
Q141
SP:ON
Q131
N:ON
Q81
N:ON
EDIT:OFF
Q82
S:ON
EDIT:OFF
CR FILTER
R201
Q80
N:ON
R200
PB Y LEVEL
R201
S PB Y LEVEL
R317
EE BURST LEV.
V PULSE
IC500
BURST GATE
R608
BURST GATE
TP503
BURST GATE
To 06
AV, CN II
COLOR IN 10
Q201
PB:OFF
REC
PB
BPF 402
5V
R439
PILOT BURST LEVEL
R440
PILOT MIX
TP422
BURST OUT
IC401
ACC VCA
IC403
PILOT MIX (S REC)
MAIN CONV
REC KILLER
REC LPF
Z CIRCUIT
IC501
Q223
COLOR:ON
TP504
REC COL
R622
VHS C.D.L.
TP501
VHS C.D.L.
R624
REC C LEV.
IC502
TP500
S-VHS C.D.L.
R616
S-VHS C.D.L.
R626
S REC C LEV.
S:ON
TP404
PB COLOR Acc IN
EE
To 06
AV, CN II
C OUT 9
Q216, Q217
AMP
IC403
PILOT BLANKING
PB KILLER
TP426
PB COLOR
R649
PB C LEV.
ACC DET
4 PHASE SHIFTER
IC403
PILOT DET
PILOT (H)
LPF 401
Q426
Q429
C468
L413
FMA TRAP
C469
L414
Fh TRAP
Q431
BIAS TRAP
L411
C466
Q430
BIAS ON:ON
2H DL
DL401
ACC FILTER
Q410, Q411, Q412
SEARCH/STILL:ON
TP411
COLOR ROTATE
EF
BPF 401
Q403
SUB CONV
1/8
BGP GEN
321fh VCO
BURST PHASE DET
IC404-5
PHASE SIG
SYNC
CF401
3fs BPF
Q402
X3
4.43MHz VXO
REC APC
PB APC
REC/PB AFC
COLOR KILLER
TP403
VXO OUT
IC403-15
4.43MHz
CR
APC/AFC FILTER
X401
4.43MHz
Q406
Q407
PB:ON
Q405
NPB:ON
B/W(L)
5V
Q408, Q409
S:ON
EE:OFF
02 Y/C
04 PRE AMP

6

4.7 AUDIO BLOCK DIAGRAM

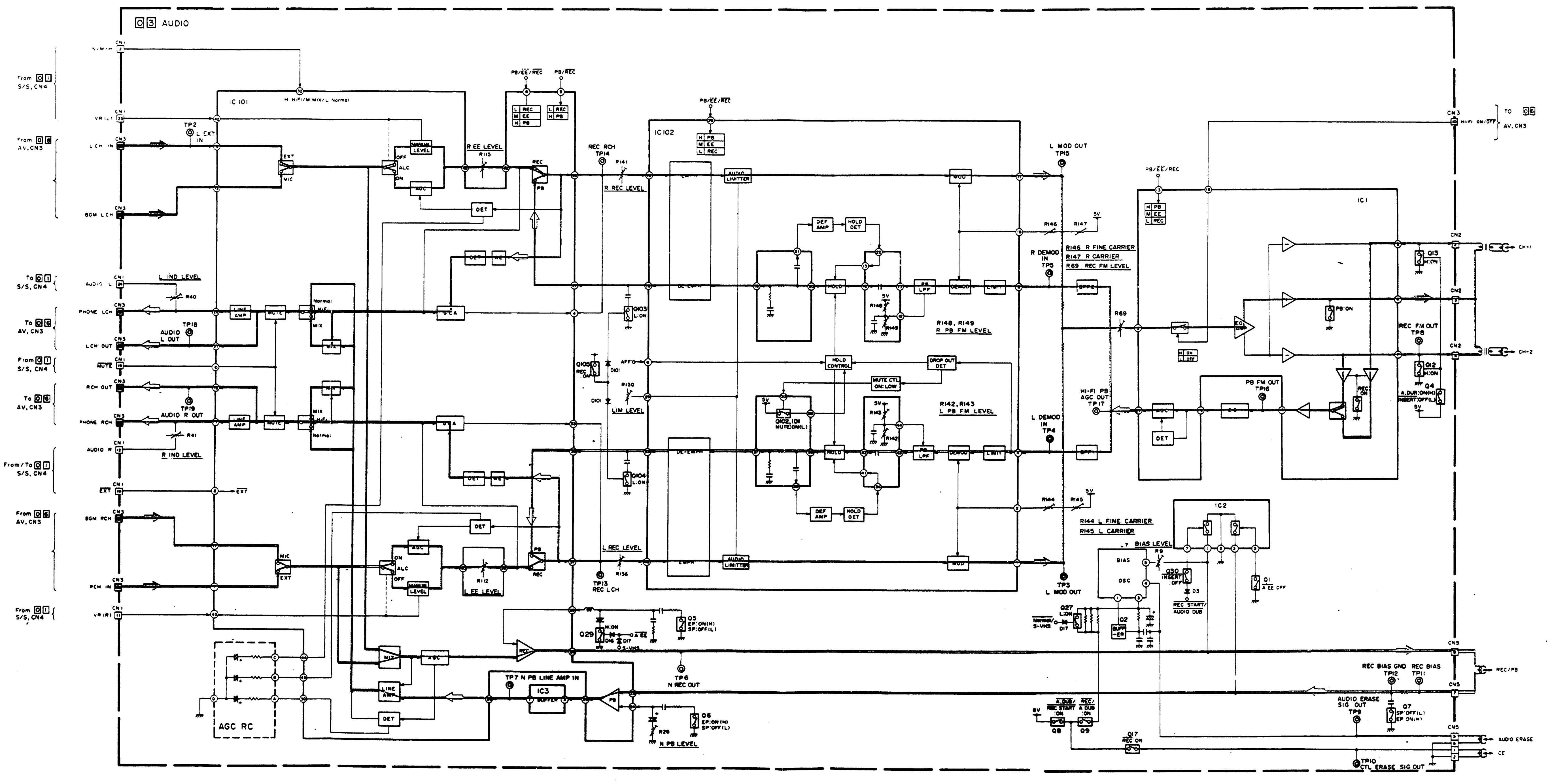
5

4

3

2

1


03 AUDIO
From 01 S/S, CN4
From 06 AV, CN3
To 01 S/S, CN4
To 06 AV, CN3
From 01 S/S, CN4
To 06 AV, CN3
From/To 01 S/S, CN4
From 06 AV, CN3
From 01 S/S, CN4
CN1 N/M/H
CN1 VR(L)
CN3 LCH IN
CN3 BGM LCH
CN1 AUDIO L
CN3 PHONE LCH
CN3 LCH OUT
CN1 MUTE
CN3 RCH OUT
CN3 PHONE RCH
CN1 AUDIO R
CN1 EXT
CN3 BGM RCH
CN3 RCH IN
CN1 VR(R)
TP2 L EXT IN
IC101
H HiFi/M:MIX/L Normal
EXT
MIC
OFF
ALC
ON
MANUAL LEVEL
AGC
R EE LEVEL
R115
PB/EE/REC
PB/REC
L REC
M EE
H PB
L REC
H PB
REC
PB
DET
DET
WE
L IND LEVEL
R40
LINE AMP
MUTE
Normal
HiFi
MIX
MIX
VCA
TP18 AUDIO L OUT
TP19 AUDIO R OUT
R41
R IND LEVEL
EXT
MIC
EXT
ON
ALC
OFF
AGC
MANUAL LEVEL
R112
L EE LEVEL
PB
REC
AGC RC
MIX
AGC
LINE AMP
DET
TP7 N PB LINE AMP IN
IC3
BUFFER
PB
REC
REC RCH TP14
R141
R REC LEVEL
Q103 L:ON
Q105 REC:ON
D101
AFF
R130
LIM LEVEL
Q104 L:ON
L REC LEVEL
R136
TP13 REC LCH
Q29
H:ON
D16
D17
A EE
S-VHS
Q5 EP:ON(H) SP:OFF(L)
TP6 N REC OUT
Q6 EP:ON(H) SP:OFF(L)
R26
N PB LEVEL
IC102
PB/EE/REC
H PB
M EE
L REC
EMPH
AUDIO LIMITTER
MOD
DE-EMPH
DEF AMP
HOLD DET
HOLD
PB LPF
DEMOD
LIMIT
5V
R148
R149
R148, R149 R PB FM LEVEL
HOLD CONTROL
DROP OUT DET
MUTE CTL ON:LOW
Q102,101 MUTE:ON(L)
R143
R142
R142, R143 L PB FM LEVEL
L MOD OUT TP15
R146
R147
R146 R FINE CARRIER
R147 R CARRIER
R69 REC FM LEVEL
R DEMOD IN TP5
BPF2
BPF1
R69
HI-FI PB AGC OUT TP17
L DEMOD IN TP4
R144
R145
R144 L FINE CARRIER
R145 L CARRIER
TP3 L MOD OUT
IC1
H ON
L OFF
EQ AMP
PB:ON
AGC
DET
EQ
PB FM OUT TP16
REC:ON
Q13 H:ON
Q12 H:ON
Q4 A.DUB:ON(H) INSERT:OFF(L)
REC FM OUT TP8
CN3 HI-FI ON/OFF
TO 06 AV, CN3
CN2
CH-1
CH-2
IC2
L7 BIAS LEVEL
BIAS
OSC
R9
Q30 INSERT:OFF
D3
REC START/AUDIO DUB
Q1 A EE OFF
Q27 L:ON
Normal/S-VHS
D17
Q2 BUFFER
A.DUB/REC START:ON
REC/A DUB:ON
8V
Q8
Q9
Q17 REC:ON
CN5
REC/PB
REC BIAS GND TP12
REC BIAS TP11
AUDIO ERASE SIG OUT TP9
Q7 SP:OFF(L) EP:ON(H)
AUDIO ERASE
CE
TP10 CTL ERASE SIG OUT

A

B

C

E

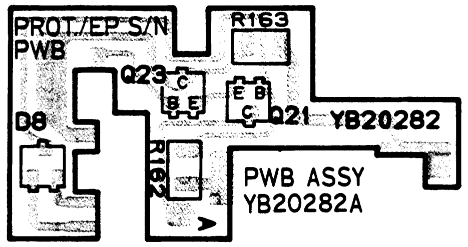
F

G

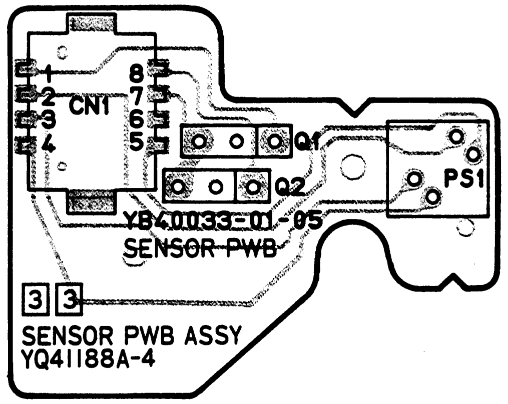
H

4.8 SENSOR, LED, PROT/EP S/N AND REC CTL BOARD LOCATION

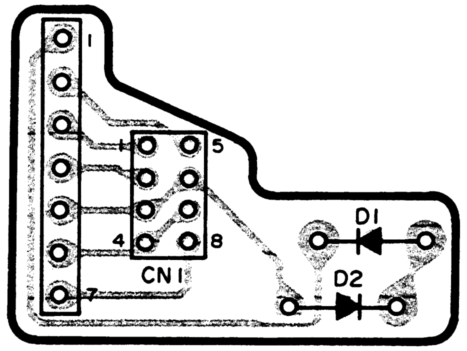
– PROT/EP S/N board –


PROT/EP S/N
PWB
R163
Q23
C
B E
E B
C
Q21
YB20282
D8
R162
1
PWB ASSY
YB20282A

– SENSOR board –

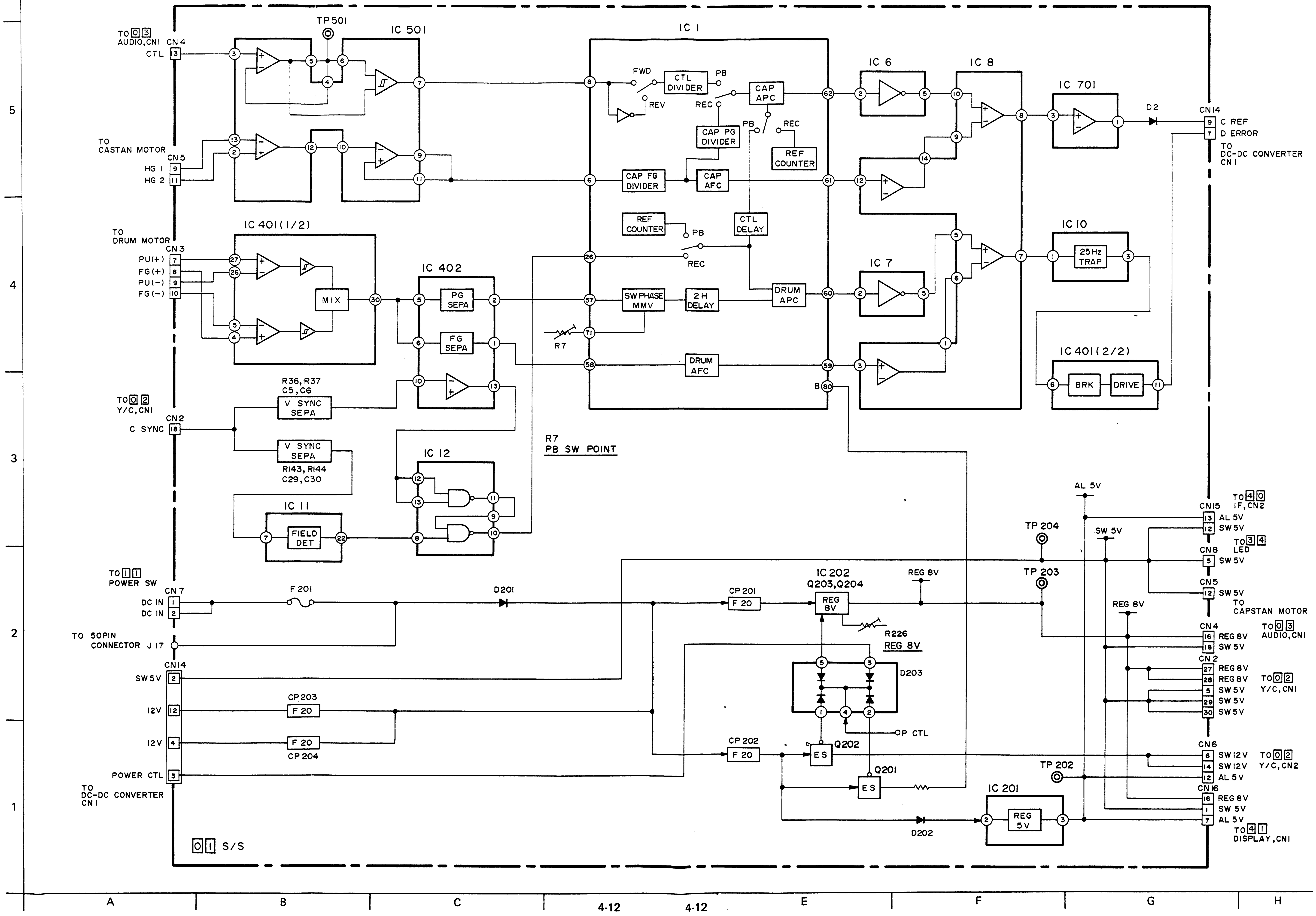

1
2
3
4
CN1
8
7
6
5
Q1
Q2
PS1
YB40033-01-05
SENSOR PWB
3 3
SENSOR PWB ASSY
YQ41188A-4

– LED board –

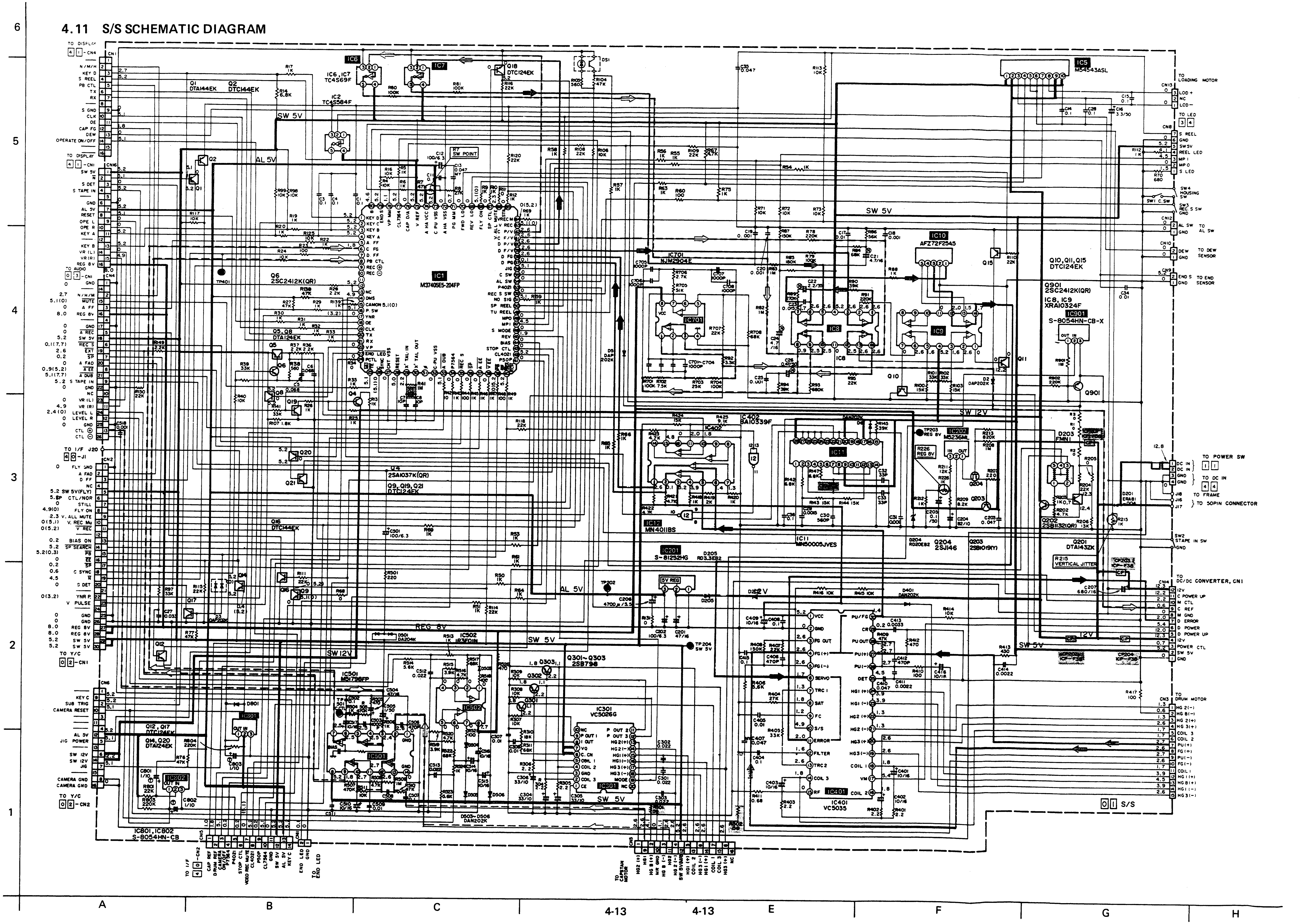

1
5
4
8
7
CN1
D1
D2

3 4 LED PWB ASS'Y YQ41189A-2
LED PWB YB40034-01-03

4.9 S/S BOARD BLOCK DIAGRM


TO 03 AUDIO,CN1
CN4
CTL 13
TP501
IC 501
IC 1
FWD
CTL DIVIDER
PB
REV
REC
CAP APC
CAP PG DIVIDER
PB
REC
REF COUNTER
CAP FG DIVIDER
CAP AFC
REF COUNTER
PB
CTL DELAY
REC
SW PHASE MMV
2H DELAY
DRUM APC
DRUM AFC
R7
B
IC 6
IC 8
IC 701
D2
CN14
9 C REF
7 D ERROR
TO DC-DC CONVERTER CN1
TO CASTAN MOTOR
CN5
HG 1 9
HG 2 11
TO DRUM MOTOR
CN3
PU(+) 7
FG(+) 8
PU(−) 9
FG(−) 10
IC 401(1/2)
MIX
IC 402
PG SEPA
FG SEPA
IC 7
IC 10
25Hz TRAP
IC 401(2/2)
BRK
DRIVE
R36, R37
C5, C6
V SYNC SEPA
TO 02 Y/C,CN1
CN2
C SYNC 18
V SYNC SEPA
R143, R144
C29, C30
IC 12
IC 11
FIELD DET
R7
PB SW POINT
AL 5V
CN15
TO 40 IF,CN2
13 AL 5V
12 SW 5V
TP 204
SW 5V
TO 34 LED
CN8
5 SW 5V
TO 11 POWER SW
CN7
DC IN 1
DC IN 2
F 201
D201
CP 201
F 20
IC 202
Q203,Q204
REG 8V
REG 8V
TP 203
CN5
12 SW 5V
TO CAPSTAN MOTOR
REG 8V
R226
REG 8V
CN4
16 REG 8V
18 SW 5V
TO 03 AUDIO,CN1
TO 50PIN CONNECTOR J17
CN14
SW5V 2
12V 12
12V 4
CP203
F 20
F 20
CP 204
D203
P CTL
CN2
27 REG 8V
28 REG 8V
5 SW 5V
29 SW 5V
30 SW 5V
TO 02 Y/C,CN1
CP 202
F 20
ES
Q202
Q201
ES
POWER CTL 3
TO DC-DC CONVERTER CN1
CN6
6 SW12V
14 SW12V
12 AL 5V
TO 02 Y/C,CN2
TP 202
IC 201
REG 5V
D202
CN16
16 REG 8V
1 SW 5V
7 AL 5V
TO 41 DISPLAY,CN1
01 S/S
6
5
4
3
2
1
A
B
C
D
E
F
G
H
4-12
4-12

4.11 S/S SCHEMATIC DIAGRAM


6
5
4
3
2
1
A
B
C
4-13
4-13
E
F
G
H
TO DISPLAY
4 1 - CN4
CN1
TO DISPLAY
4 1 - CN1
TO AUDIO
0 3 - CN1
TO I/F J20
4 0 - J1
CN2
TO Y/C
0 2 - CN1
CN6
TO Y/C
0 2 - CN2
TO I/F
4 0 - CN2
TO END LED
TO CAPSTAN MOTOR
CN5
IC6
IC7
IC6, IC7 TC4S69F
IC2 TC4S584F
Q18 DTC124EK
Q1 DTA144EK
Q2 DTC144EK
SW 5V
AL 5V
IC1
M37405E5-204FP
R7 SW POINT
Q6 2SC2412K(QR)
Q5, Q8 DTA124EK
Q4 2SA1037K(QR)
Q9, Q19, Q21 DTC124EK
Q16 DTC144EK
Q12, Q17 DTC124EK
Q14, Q20 DTA124EK
IC801, IC802 S-8054HN-CB
IC501 M51796FP
IC502 IR3F01N
REG 8V
SW 12V
Q301~Q303 2SB798
IC301 VC5026G
TP401
TP202
TP204 SW 5V
IC701 NJM2904E
IC8
IC9
IC10 AFZ72F2545
IC5 M54543ASL
Q10, Q11, Q15 DTC124EK
Q901 2SC2412K(QR)
IC8, IC9 XRA10324F
IC901 S-8054HN-CB-X
IC402 BA10339F
IC11 MN50005JVES
IC12 MN4011BS
IC201 S-81252HG
IC202 M5236ML
R226 REG 8V
TP203 REG 8V
Q204 2SJ146
Q203 2SB1019(Y)
D204 RD20EB2
D205 RD3.3EB2
D203 FMN1
Q202 2SB1132(QR)
Q201 DTA143ZK
R215 VERTICAL JITTER
IC401 VC5035
D401 DA202K
D501 DA204K
D503~D506 DA202K
5V REG
SW 12V
TO LOADING MOTOR
CN13
TO LED
3 4
CN8
CN12
TO AL SW
CN10
TO DEW SENSOR
CN9
TO END SENSOR
TO POWER SW
1 1
TO DC IN
4 4
TO FRAME
TO SOPIN CONNECTOR
SW2 STAPE IN SW
TO DC/DC CONVERTER, CN1
CN14
TO DRUM MOTOR
CN3
0 1 S/S

■ INDEX OF CHIP PARTS ADDRESS TO REAR SIDE (S/S)

IC

SYMBOL	ADDRESSE
IC 2	A-8E, F
IC 6	A-9, 10F
IC 7	A-9, 10F, G
IC 11	A-6, 7, 8A, B
IC 12	A-8, 9B, C
IC 202	A-3D, E
IC 301	A-6, 7B, C
IC 701	A-3C
IC 801	A-2, 3D, E
IC 802	A-3D, E

TRANSISTOR

SYMBOL	ADDRESSE
Q 2	A-6, 7G, H
Q 4	A-5, 6F, G
Q 5	A-6, 7F
Q 6	A-6F
Q 10	A-9, 10G
Q 12	A-6D
Q 15	A-8E
Q 16	A-8B, C
Q 17	A-9, 10G
Q 18	A-6F, G
Q 21	A-4, 5D
Q 202	A-3, 4F
Q 204	A-3, 4E, F

DIODE

SYMBOL	ADDRESSE
D 2	A-8, 9E, F
D 3	A-8, 9F
D 5	A-5F
D 203	A-3F, G
D 501	A-8C
D 503	A-10B
D 504	A-10B, C
D 506	A-10A
D 801	A-2D

RESISTOR

SYMBOL	ADDRESSE
R 1	A-6F
R 2	A-5F
R 3	A-6E, F
R 4	A-5F
R 5	A-5F
R 6	A-5E, F
R 9	A-6E
R 10	A-5D, E
R 11	A-5D, E
R 12	A-5D
R 13	A-5, 6G
R 16	A-3G

RESISTOR

SYMBOL	ADDRESSE
R 25	A-6F
R 26	A-6F
R 28	A-6F
R 30	A-7F
R 31	A-7F
R 32	A-7F
R 33	A-7F, G
R 36	A-7F
R 37	A-7F
R 38	A-7F
R 39	A-6F
R 40	A-6F, G
R 41	A-7E
R 44	A-8E
R 46	A-8D
R 47	A-7E
R 48	A-7E
R 49	A-8G
R 51	A-8G
R 53	A-7, 8E
R 55	A-5D
R 56	A-4, 5D
R 57	A-6, 7D
R 59	A-6E
R 61	A-7, 8D
R 65	A-7D
R 66	A-6, 7D
R 67	A-3F, G
R 70	A-1, 2G
R 72	A-1, 2G
R 73	A-4, 5G
R 75	A-2G
R 77	A-9G
R 79	A-9E, F
R 80	A-10F
R 81	A-10F
R 82	A-10F
R 83	A-10F
R 84	A-9F
R 85	A-9F
R 86	A-9F
R 87	A-9F
R 88	A-10G
R 94	A-10F
R 97	A-5D, E
R 99	A-6F
R 100	A-10G
R 101	A-10G
R 102	A-10G
R 103	A-10G
R 105	A-4B
R 107	A-5G
R 108	A-5F
R 109	A-5, 6F
R 110	A-8D
R 111	A-6D
R 112	A-2G
R 113	A-3G
R 117	A-5, 6G
R 131	A-4H
R 138	A-5H
R 139	A-4, 5D, E
R 140	A-8E
R 141	A-6F
R 149	A-9B

RESISTOR

SYMBOL	ADDRESSE
R 150	A-8B
R 202	A-3F
R 203	A-3, 4F, G
R 207	A-1, 2G
R 208	A-3F
R 211	A-3E
R 212	A-3E
R 213	A-3, 4F
R 304	A-7C
R 305	A-7C
R 306	A-7, 8C
R 311	A-6B, C
R 401	A-10D
R 402	A-10C
R 404	A-10E
R 405	A-10E
R 407	A-9E
R 408	A-10E
R 409	A-10D
R 410	A-9, 10C
R 412	A-10E
R 413	A-9D
R 414	A-9D
R 417	A-10D
R 420	A-9D
R 421	A-9D
R 423	A-9D
R 424	A-9D
R 425	A-9D
R 501	A-8C, D
R 503	A-9C
R 504	A-9C
R 505	A-9C
R 506	A-9C
R 510	A-9B
R 513	A-10B
R 516	A-10B
R 517	A-10B
R 518	A-10A
R 520	A-9B
R 521	A-10B
R 522	A-9, 10B
R 524	A-9, 10B
R 526	A-8B
R 701	A-2, 3C
R 702	A-2, 3C
R 703	A-3D
R 704	A-3D
R 705	A-3D
R 706	A-3D
R 707	A-3C
R 708	A-3C
R 801	A-3E
R 803	A-2, 3E
R 804	A-2E

CAPACITOR

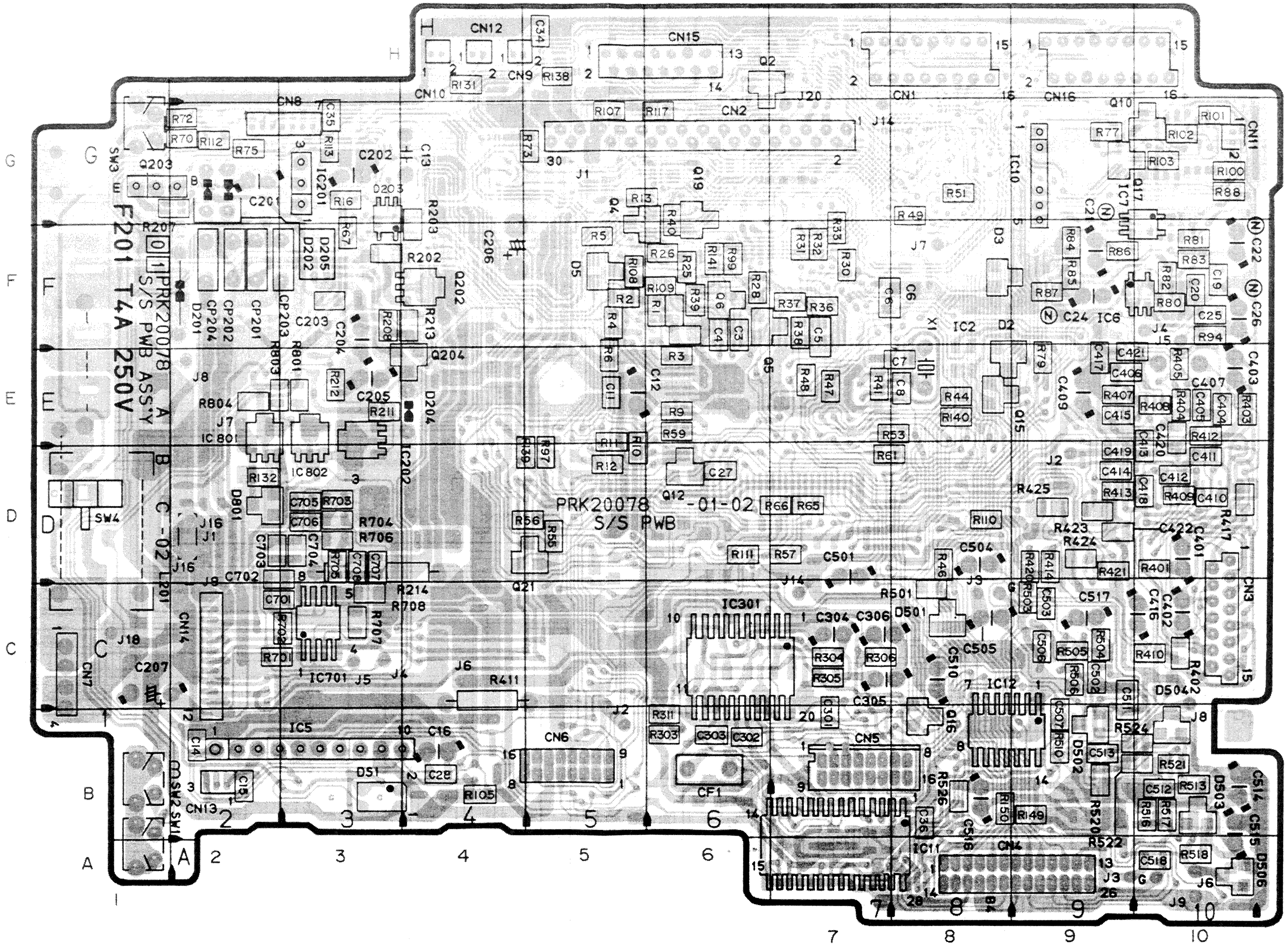
SYMBOL	ADDRESSE
C 3	A-6F
C 4	A-6F
C 5	A-7E, F
C 6	A-7, 8F
C 7	A-7, 8E
C 8	A-8E
C 11	A-5E
C 14	A-2B
C 15	A-2B
C 19	A-10F
C 20	A-10F
C 25	A-10F
C 27	A-6D
C 28	A-4B
C 34	A-5H
C 35	A-3G
C 36	A-8B
C 203	A-3F
C 301	A-7B, C
C 302	A-6B
C 303	A-6B
C 403	A-10E
C 404	A-10E
C 405	A-10E
C 406	A-9EE
C 410	A-10D
C 411	A-10D
C 412	A-10D
C 413	A-9, 10D, E
C 414	A-9D
C 415	A-9E
C 502	A-9C
C 503	A-9C
C 506	A-9C
C 507	A-9B, C
C 511	A-9B, C
C 512	A-10B
C 513	A-9B
C 518	A-10A
C 701	A-2, 3C
C 702	A-2, 3C, D
C 703	A-2, 3D
C 704	A-3D
C 705	A-3D
C 706	A-3D
C 707	A-3D
C 708	A-3D

Note: Address of chip parts

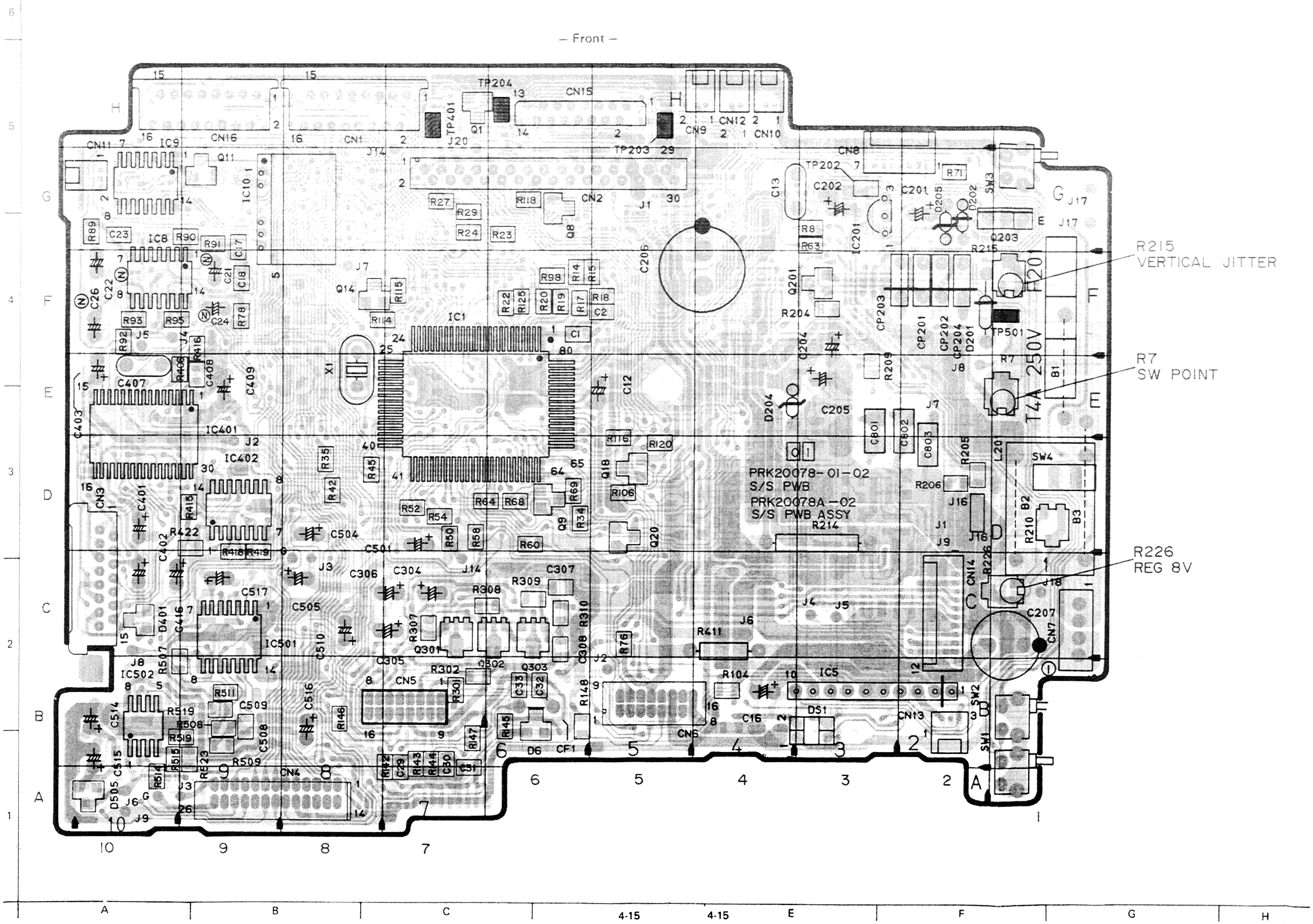
A-2B
- Address
- A : Rear
- B : Front

4.11 S/S CIRCUIT BOARD

— Rear —


PRK20078-01-02
S/S PWB
PRK20078
S/S PWB ASS'Y
F201 T4A 250V
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
CN15
CN16
CF1
IC2
IC5
IC6
IC7
IC10
IC11
IC12
IC201
IC202
IC301
IC701
IC801
IC802
Q2
Q4
Q5
Q6
Q10
Q12
Q15
Q16
Q17
Q19
Q21
Q202
Q203
Q204
D2
D3
D5
D51
D201
D202
D203
D204
D205
D501
D502
D503
D504
D506
D801
X1
SW1
SW2
SW3
SW4
J1
J2
J3
J4
J5
J6
J7
J8
J9
J14
J15
J16
J18
J20
L201
CP201
CP202
CP203
CP204
C207
C401
C402
C403
C501
C504
C505
C517
R411
R425
R423
R424
G
F
E
D
C
B
A
2
3
4
5
6
7
8
9
10
H

6
5
4
3
2
1
A
B
C
4-14
4-14
E
F
G
H


– Front –
PRK20078-01-02
S/S PWB
PRK20078A-02
S/S PWB ASSY
R215
VERTICAL JITTER
R7
SW POINT
R226
REG 8V
T4A 250V
IC1
IC401
IC402
IC501
IC502
IC5
IC8
IC9
IC10
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
CN15
CN16
TP202
TP203
TP204
TP401
TP501
SW1
SW2
SW3
SW4
X1
DS1
F201
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
4-15
4-15

■ INDEX OF CHIP PARTS ADDRESS TO FRONT SIDE (S/S)

IC

SYMBOL	ADDRESSE
IC 1	B-6, 7, 8D, E, F
IC 8	B-9, 10F, G
IC 9	B-10G
IC 401	B-9, 10D, E
IC 402	B-9D
IC 501	B-9B, C
IC 502	B-10B

TRANSISTOR

SYMBOL	ADDRESSE
Q 1	B-6, 7H
Q 8	B-6G
Q 9	B-6D
Q 11	B-9G
Q 14	B-7, 8F
Q 18	B-5D
Q 20	B-5D
Q 201	B-3F
Q 301	B-7B, C
Q 302	B-6, 7B, C
Q 303	B-6B, C

DIODE

SYMBOL	ADDRESSE
D 6	B-6B
D 401	B-10C
D 505	B-10A

RESISTOR

SYMBOL	ADDRESSE
R 7	B-1, 2E
R 8	B-3, 4G
R 14	B-6F
R 17	B-6F
R 19	B-6F
R 20	B-6F
R 22	B-6F
R 23	B-6G
R 24	B-7G
R 27	B-7G
R 29	B-7G
R 34	B-6D
R 35	B-8D
R 42	B-8D
R 45	B-8D
R 50	B-7D
R 54	B-7D
R 58	B-7D
R 60	B-6D
R 63	B-3, 4F, G
R 68	B-6D
R 69	B-6D
R 71	B-2G

RESISTOR

SYMBOL	ADDRESSE
R 76	B-5B
R 78	B-9F
R 89	B-10G
R 90	B-9, 10G
R 91	B-9G
R 92	B-10F
R 93	B-10F
R 95	B-9, 10F
R 98	B-6F
R 104	B-4B
R 106	B-5D
R 114	B-7, 8F
R 115	B-7F
R 116	B-5D, E
R 118	B-6G
R 120	B-5D, E
R 125	B-6F
R 142	B-7, 8A, B
R 143	B-7A, B
R 144	B-7A, B
R 145	B-6B
R 147	B-7B
R 204	B-3F
R 205	B-2D
R 206	B-2D
R 209	B-3E
R 215	B-1F
R 226	B-1, 2C
R 301	B-6, 7B
R 302	B-7B
R 307	B-7C
R 308	B-6, 7C
R 309	B-7C
R 310	B-7C
R 406	B-9, 10E
R 415	B-9D
R 416	B-9E, F
R 418	B-9C, D
R 419	B-9C, D
R 422	B-9, 10C, D
R 507	B-9, 10B, C
R 508	B-9B
R 509	B-9B
R 511	B-9B
R 514	B-10A, B
R 515	B-9, 10A, B
R 519	B-9, 10B
R 523	B-9A, BB

CAPACITOR

SYMBOL	ADDRESSE
C 1	B-6F
C 2	B-5, 6F
C 17	B-9F, G
C 18	B-9F
C 23	B-10G
C 29	B-7A, B
C 30	B-7A, B
C 31	B-7A, B
C 32	B-6B
C 33	B-6B
C 307	B-6B
C 308	B-6B, C
C 508	B-9B
C 509	B-9B
C 801	B-3D, E
C 802	B-2, 3D, E
C 803	B-2D, E

TEST PIN

SYMBOL	ADDRESSE
TP 203	B-5H
TP 204	B-6H
TP 401	B-7H
TP 501	B-1F

Note: Address of chip parts

A-2B

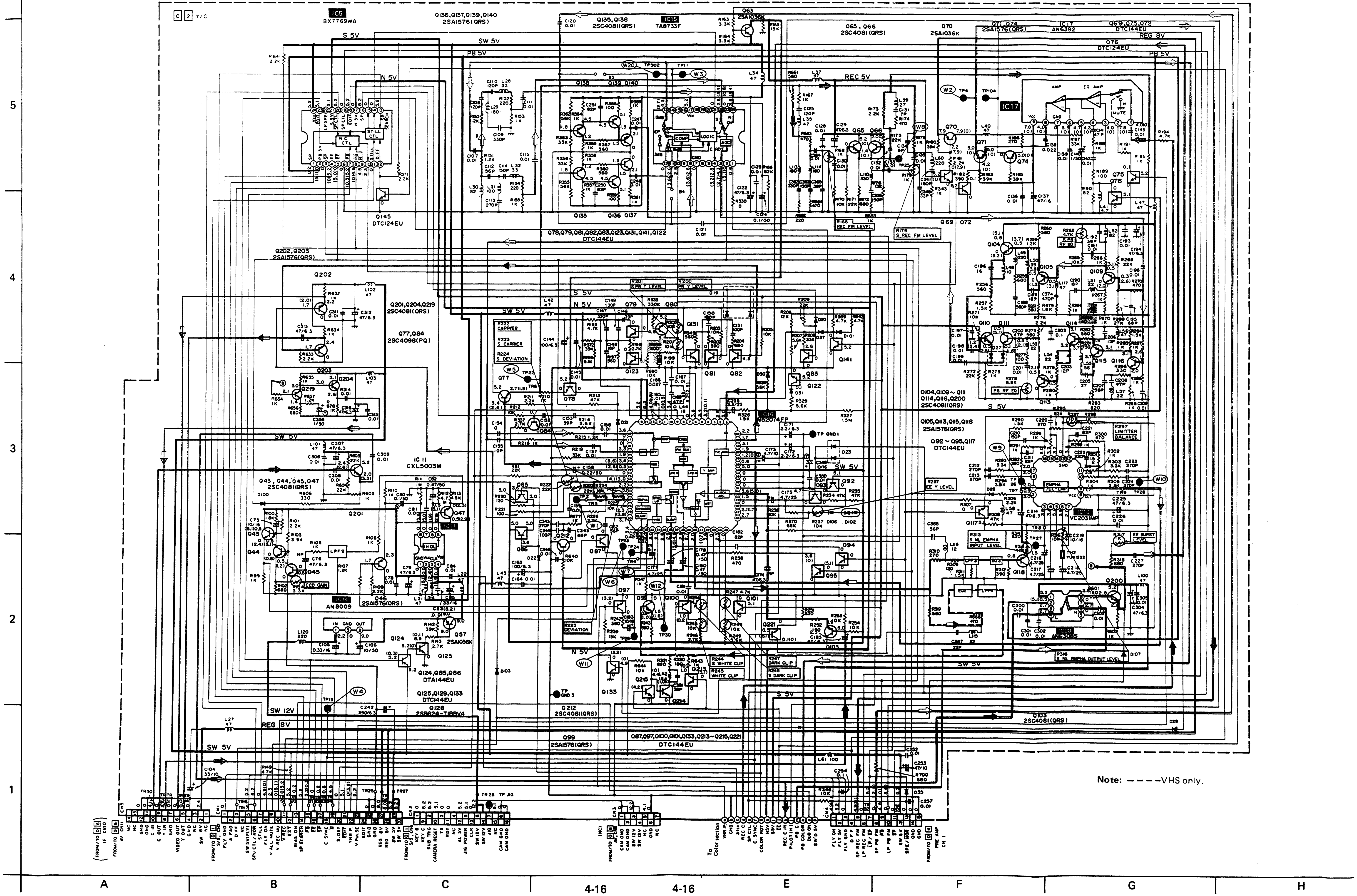
└── Address

└── A : Rear

B : Front

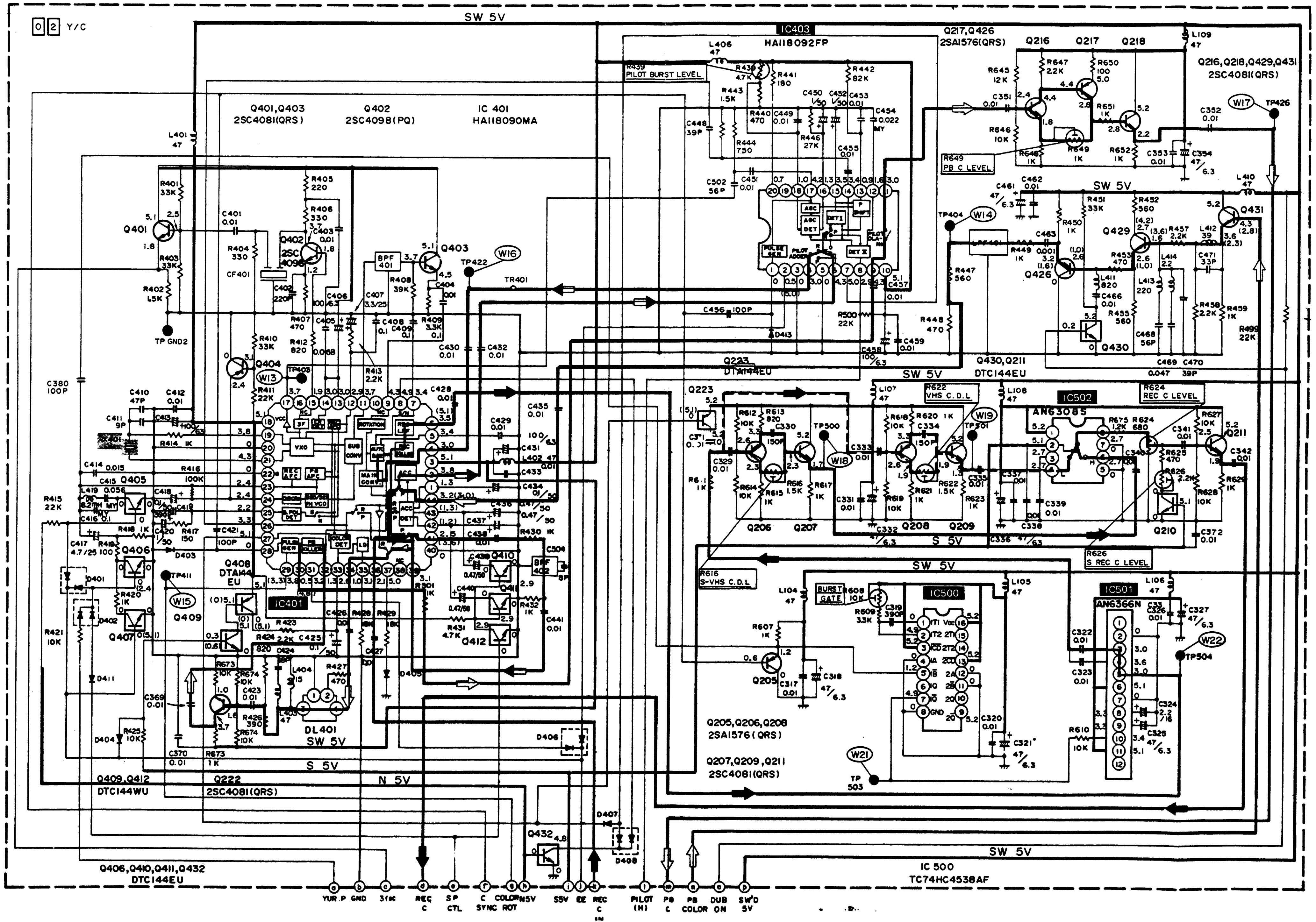
4.12 Y/C SCHEMATIC DIAGRAM

— Luminous section —



IC5 BX7769WA
Q136,Q137,Q139,Q140 2SA1576(QRS)
Q135,Q138 2SC4081(QRS)
IC15 TA8733F
Q63 2SA1036K
Q65, Q66 2SC4081(QRS)
Q70 2SA1036K
Q71, Q74 2SA1576(QRS)
IC17 AN6392
Q69,Q75,Q72 DTC144EU
Q76 DTC124EU
S 5V
SW 5V
PB 5V
N 5V
REC 5V
REG 8V
Q145 DTC124EU
Q78,Q79,Q81,Q82,Q83,Q123,Q131,Q141,Q122 DTC144EU
Q202,Q203 2SA1576(QRS)
Q201,Q204,Q219 2SC4081(QRS)
Q77,Q84 2SC4098(PQ)
IC16 M52074FP
Q104,Q109~Q111 Q114,Q116,Q200 2SC4081(QRS)
Q105,Q113,Q115,Q118 2SA1576(QRS)
Q92~Q95,Q117 DTC144EU
IC 11 CXL5003M
Q43, Q44, Q45, Q47 2SC4081(QRS)
IC14 AN8009
Q46 2SA1576(QRS)
Q57 2SA1036K
Q124,Q85,Q86 DTA144EU
Q125,Q129,Q133 DTC144EU
Q128 2SB624-T1BBV4
Q212 2SC4081(QRS)
Q99 2SA1576(QRS)
Q87,Q97,Q100,Q101,Q133,Q213~Q215,Q221 DTC144EU
Q103 2SC4081(QRS)
IC20 AN6308S
IC18 VC2031MF
R201 S PB Y LEVEL
R200 PB Y LEVEL
R222 CARRIER
R223 S CARRIER
R224 S DEVIATION
R225 DEVIATION
R168 REC FM LEVEL
R179 S REC FM LEVEL
R237 EE Y LEVEL
R297 LIMITTER BALANCE
R313 S NL EMPHA INPUT LEVEL
R317 EE BURST LEVEL
R316 S NL EMPHA OUTPUT LEVEL
R244 S WHITE CLIP
R245 WHITE CLIP
R247 DARK CLIP
R248 S DARK CLIP
SW 12V
SW 5V
REG 8V
CN5
CN1
CN2
CN3
CN4
To Color section
Note: ----VHS only.
1
2
3
4
5
6
A
B
C
D
E
F
G
H

– Color section –

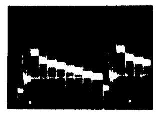

02 Y/C
SW 5V
S 5V
N 5V
IC403
HA118092FP
IC 401
HA118090MA
Q401,Q403
2SC4081(QRS)
Q402
2SC4098(PQ)
Q217,Q426
2SA1576(QRS)
Q216,Q218,Q429,Q431
2SC4081(QRS)
Q430,Q211
DTC144EU
Q223
DTA144EU
IC502
AN6308S
IC500
IC501
AN6366N
Q205,Q206,Q208
2SA1576(QRS)
Q207,Q209,Q211
2SC4081(QRS)
Q409,Q412
DTC144WU
Q222
2SC4081(QRS)
Q406,Q410,Q411,Q432
DTC144EU
Q408
DTA144EU
IC 500
TC74HC4538AF
DL401
R439 PILOT BURST LEVEL
R649 PB C LEVEL
R622 VHS C.D.L
R624 REC C LEVEL
R626 S REC C LEVEL
R616 S-VHS C.D.L
BURST GATE
TP GND2
TP403
TP422
TP404
TP426
TP411
TP500
TP501
TP504
TP 503
W13
W14
W15
W16
W17
W18
W19
W21
W22
YUR.P
GND
3fsc
REC C
SP CTL
C SYNC
COLOR ROT
N5V
S5V
EE
REC C
PILOT (H)
PB C
PB COLOR
DUB ON
SW'D 5V

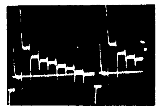
To Luminous section

Note: – – – – VHS only.

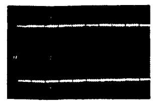
■ WAVEFORMS OF Y/C CIRCUIT

W1

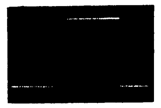

TP3
0.5 Vp-p
[S-VHS REC]


TP3
0.7 Vp-p
[VHS REC]

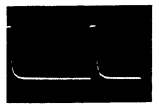
W2


TP4
S-VHS:4.2 Vp-p
VHS:3.5 Vp-p
[REC]

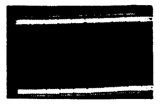
W3


TP11
5.0 Vp-p/25 Hz
[REC/PB]

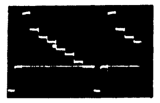
W4

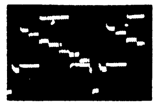

TP15
4.0 Vp-p/
15.75 kHz
[E-E]

W5

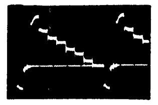

TP22
1.2 Vp-p
[REC]

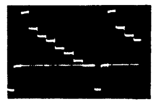
W6

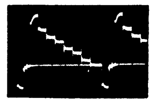

TP23
270 mVp-p
[S-VHS PB]

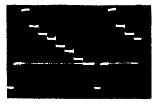

TP23
270 mVp-p
[VHS PB]

W7

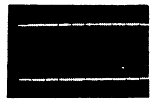

TP24
280 mVp-p
[S-VHS REC]


TP24
230 mVp-p
[VHS REC]

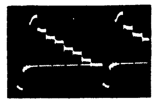

TP24
270 mVp-p
[S-VHS PB]


TP24
270 mVp-p
[VHS PB]

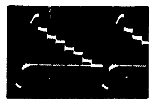
W8


TP25
S-VHS:150 mVp-p
VHS:180 mVp-p
[REC]

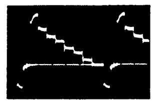
W9

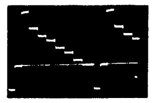

TP26
0.4 Vp-p
[S-VHS]
[REC/PB]

W10

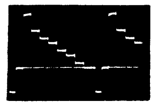

TP28
0.5 Vp-p
[S-VHS REC]

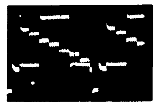
W11


TP29
0.7 Vp-p
[S-VHS REC]

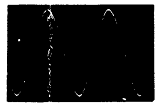

TP29
0.7 Vp-p
[VHS REC]

W12

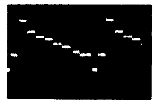

TP30
0.4 Vp-p
[VHS REC]

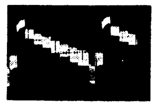

TP30
0.5 Vp-p
[VHS PB]

W13

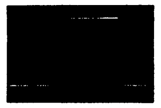

TP403
320 mVp-p/
4.43 MHz
[REC/PB]

W14

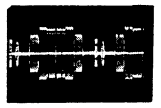

TP404
110 mVp-p
[S-VHS PB]

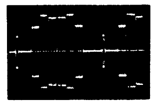

TP404
130 mVp-p
[VHS PB]

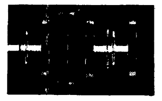
W15

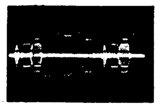

TP411
5.0 Vp-p/25 Hz
[REC/PB]

W16

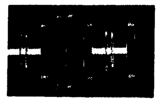

TP422
200 mVp-p
[S-VHS REC]

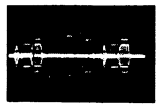

TP422
200 mVp-p
[VHS REC]


TP422
0.7 Vp-p
[S-VHS PB]

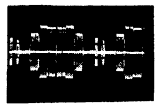

TP422
0.7 Vp-p
[VHS PB]

W17

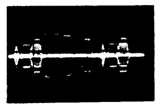

TP426
0.8 Vp-p
[S-VHS PB]


TP426
0.7 Vp-p
[VHS PB]

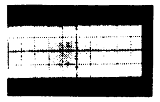
W18


TP500
0.5 Vp-p
[S-VHS REC]

W19

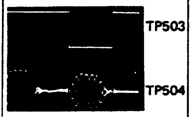

TP501
0.4 V
[VHS REC]

W20


TP502
more then
1.0 Vp-p
[S-VHS PB]

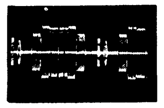
TP502
more than
0.6 Vp-p
[VHS PB]

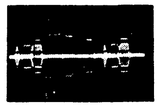
W21



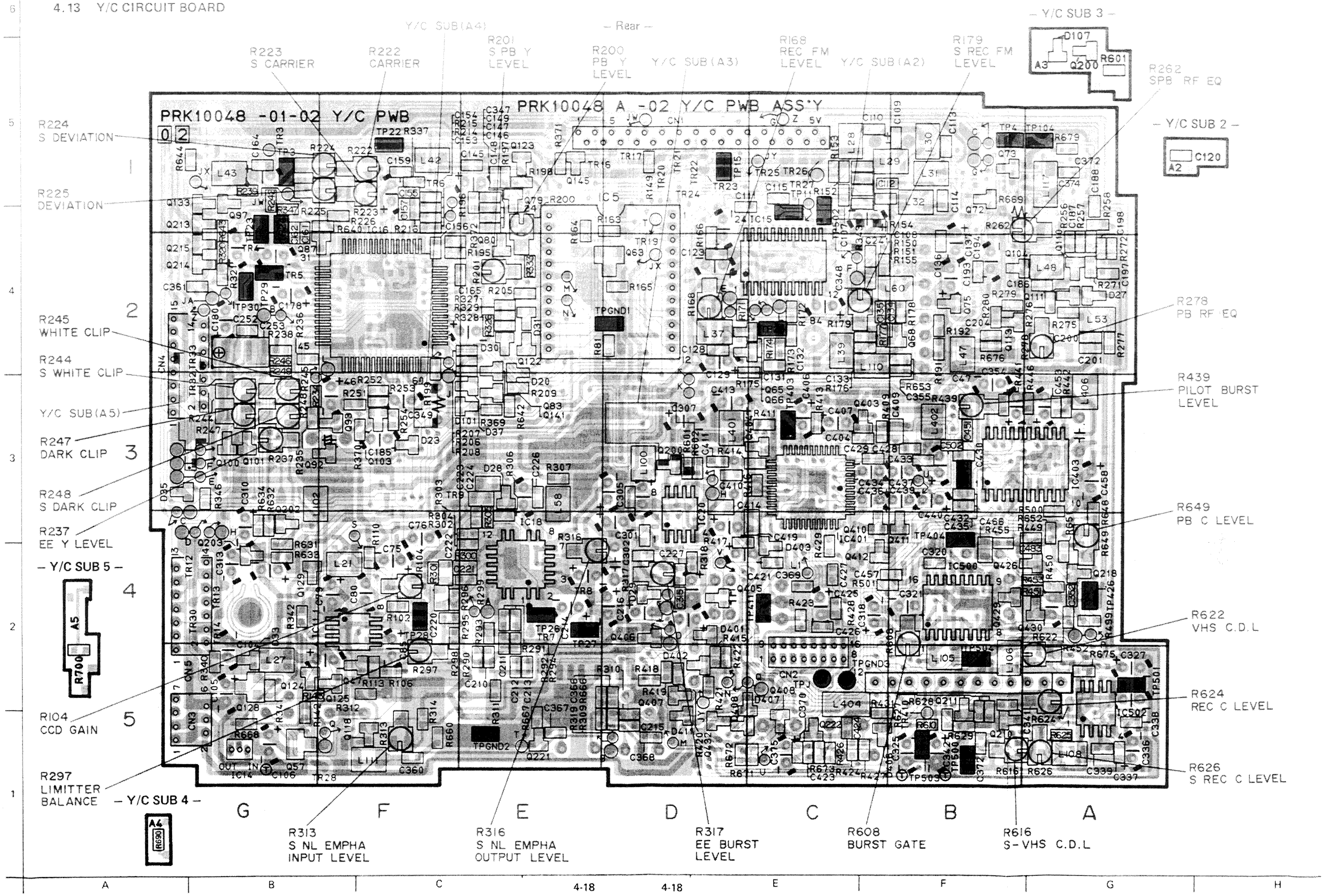
TP503
5.0 Vp-p
[REC/PB]

W22


TP504
0.4 Vp-p
[S-VHS REC]


TP504
0.4 Vp-p
[VHS REC]

4.13 Y/C CIRCUIT BOARD


- Y/C SUB 3 -
Y/C SUB(A4)
- Rear -
R223
S CARRIER
R222
CARRIER
R201
S PB Y
LEVEL
R200
PB Y
LEVEL
Y/C SUB(A3)
R168
REC FM
LEVEL
Y/C SUB(A2)
R179
S REC FM
LEVEL
R262
SPB RF EQ
- Y/C SUB 2 -
PRK10048 -01-02 Y/C PWB
PRK10048 A -02 Y/C PWB ASS'Y
R224
S DEVIATION
R225
DEVIATION
R245
WHITE CLIP
R244
S WHITE CLIP
Y/C SUB(A5)
R247
DARK CLIP
R248
S DARK CLIP
R237
EE Y LEVEL
- Y/C SUB 5 -
R104
CCD GAIN
R297
LIMITTER
BALANCE
- Y/C SUB 4 -
R313
S NL EMPHA
INPUT LEVEL
R316
S NL EMPHA
OUTPUT LEVEL
R317
EE BURST
LEVEL
R608
BURST GATE
R616
S-VHS C.D.L
R278
PB RF EQ
R439
PILOT BURST
LEVEL
R649
PB C LEVEL
R622
VHS C.D.L
R624
REC C LEVEL
R626
S REC C LEVEL
G
F
E
D
C
B
A
1
2
3
4
5
6
A
B
C
D
E
F
G
H

■ INDEX OF CHIP PARTS ADDRESS TO REAR SIDE

IC

SYMBOL	ADDRESSE
IC 11	A-4, 5F
IC 15	A-1, 2C, D
IC 16	A-2F
IC 18	A-4E
IC 20	A-3, 4D
IC 401	A-3, 4C
IC 402	A-3A, B
IC 500	A-4B
IC 502	A-5A

TRANSISTOR

SYMBOL	ADDRESSE
Q 47	A-5F
Q 57	A-6G
Q 63	A-2D, E
Q 65	A-2C, D
Q 66	A-2C, D
Q 72	A-1B
Q 75	A-2B
Q 79	A-1E
Q 80	A-2E
Q 83	A-2, 3E
Q 87	A-2F, G
Q 92	A-3F, G
Q 93	A-3F
Q 97	A-1G
Q 100	A-3G
Q 101	A-3G
Q 103	A-3F
Q 104	A-2A, B
Q 110	A-2A
Q 111	A-2A
Q 113	A-2B
Q 118	A-5F
Q 122	A-2E
Q 123	A-1E
Q 124	A-5G
Q 125	A-5F
Q 133	A-1G
Q 141	A-3E
Q 145	A-1E
Q 200	Y/C SUB (A3)
Q 202	A-4G
Q 203	A-4G
Q 210	A-5B
Q 211	A-6B
Q 213	A-1G
Q 214	A-2G
Q 215	A-2G
Q 218	A-4A
Q 221	A-5E
Q 222	A-5C
Q 403	A-3C
Q 404	A-3C
Q 405	A-4D
Q 406	A-4, 5D
Q 407	A-5D
Q 408	A-5C
Q 410	A-4C
Q 411	A-4B
Q 412	A-4C
Q 426	A-4A, B
Q 429	A-4B
Q 430	A-4A
Q 432	A-5D

DIODE

SYMBOL	ADDRESSE
D 20	A-2, 3B
D 23	A-3F
D 27	A-2A
D 28	A-3E
D 29	A-4D
D 30	A-2E
D 31	A-2E
D 33	A-5G
D 35	A-3G
D 37	A-3E, F
D 101	A-3E, F
D 107	Y/C SUB (A3)
D 401	A-4D
D 402	A-5D
D 403	A-4C
D 406	A-5B, C
D 407	A-5C, D
D 408	A-5C, D
D 411	A-5D

RESISTOR

SYMBOL	ADDRESSE
R 81	A-2D
R 102	A-4F
R 104	A-4F
R 106	A-5F
R 110	A-4F
R 113	A-5F
R 142	A-5G
R 143	A-5F, G
R 149	A-1D
R 150	A-1C
R 151	A-1C
R 152	A-1C
R 153	A-1C
R 154	A-1B, C
R 155	A-1C
R 163	A-1, 2D, E
R 164	A-1, 2E
R 165	A-2D
R 166	A-1, 2D
R 168	A-2D
R 171	A-2D
R 172	A-2C
R 173	A-2C
R 174	A-2C
R 175	A-2, 3C, D
R 176	A-2C
R 178	A-2B
R 179	A-2C
R 191	A-2B
R 195	A-2E, F
R 196	A-1E
R 197	A-1E
R 198	A-1E
R 199	A-2, 3F
R 200	A-1, 2E
R 201	A-2E
R 205	A-2E
R 206	A-2E, F
R 207	A-2E, F
R 208	A-2, 3E, F
R 209	A-3E
R 214	A-1F
R 215	A-1F
R 216	A-1F
R 222	A-1F

RESISTOR

SYMBOL	ADDRESSE
R 223	A-1F
R 224	A-1F, G
R 225	A-1F, G
R 226	A-1F
R 234	A-3F, G
R 235	A-3G
R 236	A-2G
R 237	A-3G
R 238	A-2G
R 239	A-1G
R 242	A-1G
R 244	A-3G
R 245	A-3G
R 246	A-2G
R 247	A-3G
R 248	A-3G
R 249	A-2, 3G
R 251	A-3F
R 252	A-3F
R 253	A-3F
R 254	A-3F
R 256	A-2A
R 257	A-2A
R 258	A-1A
R 262	A-1, 2A, B
R 269	B-1, 2B
R 271	A-2A
R 272	A-2A
R 275	A-2A
R 276	A-2A
R 277	A-2A
R 278	2-2A
R 279	A-2B
R 280	A-2B
R 290	A-5E
R 291	A-4, 5E
R 292	A-4E
R 293	A-4E
R 294	A-4E
R 295	A-4F
R 296	A-4F
R 297	A-4, 5F
R 298	A-4, 5F
R 299	A-4E, F
R 300	A-4E, F
R 301	A-4F
R 302	A-4E
R 303	A-3, 4E
R 304	A-4E
R 305	A-3, 4E
R 306	A-4E
R 307	A-3E
R 309	A-5D
R 310	A-5D
R 311	A-5E
R 312	A-5F
R 313	A-5F
R 314	A-5F
R 316	A-4D, E
R 317	A-4D
R 318	A-4D
R 319	A-5D, E
R 320	A-2G
R 321	A-2G
R 326	A-2E
R 327	A-2E
R 328	A-2E
R 333	A-3E
R 337	A-1F
R 343	A-2C
R 346	A-3G

RESISTOR

SYMBOL	ADDRESSE
R 347	A-1G
R 369	A-3E
R 370	A-3F
R 371	A-1E
R 372	A-2E, F
R 409	A-3C
R 411	A-3C
R 413	A-3C
R 414	A-3C, D
R 415	A-5D
R 416	A-3C
R 417	A-4C, D
R 418	A-5D
R 419	A-5D
R 420	A-5D
R 421	A-5D
R 422	A-5D
R 423	A-4C
R 424	A-5C
R 426	A-5C
R 427	A-5C
R 428	A-4C
R 429	A-4C
R 431	A-5B, C
R 439	A-3B
R 441	A-3B
R 442	A-3A
R 446	A-3A
R 449	A-4A
R 450	A-4A
R 451	A-4A
R 452	A-4A
R 453	A-4A
R 455	A-4B
R 499	A-4A
R 500	A-3, 4A
R 501	A-4B, C
R 601	Y/C SUB (A3)
R 602	A-3D
R 608	A-4, 5B
R 610	A-5B
R 616	A-5A, B
R 622	A-5A
R 624	A-5A
R 625	A-5A
R 626	A-5A
R 627	A-5B
R 628	A-5B
R 629	A-5B
R 632	A-4G
R 633	A-4G
R 634	A-4G
R 640	A-1F, G
R 642	A-3E
R 643	A-1, 2G
R 644	A-1G
R 648	A-3, 4A
R 649	A-4A
R 651	A-4A
R 652	A-4A
R 653	A-2B
R 662	B-3D
R 666	A-5D
R 671	A-5C
R 672	A-5D
R 673	A-5C
R 675	A-5A
R 679	A-1A
R 690	Y/C SUB (A4)
R 700	Y/C SUB (A5)

CAPACITOR

SYMBOL	ADDRESSE
C 107	A-1C
C 108	A-1C
C 109	A-1B
C 110	A-1C
C 111	A-1C, D
C 112	A-1B, C
C 113	A-1B
C 114	A-1B
C 115	A-1C
C 120	Y/C SUB (A2)
C 123	A-2D
C 128	A-2D
C 131	A-2C
C 132	A-2C
C 133	A-2C
C 134	A-2B, C
C 135	A-2C
C 136	A-2B
C 145	A-1E
C 146	A-1E
C 147	A-1E
C 148	A-1E
C 149	A-1E
C 153	A-1F
C 154	A-1F
C 155	A-1F
C 156	A-2F
C 157	A-1F
C 159	A-1F
C 162	A-1, 2G
C 164	A-1G
C 165	A-2E, F
C 186	A-2A
C 188	A-1A
C 193	A-2B
C 197	A-2A
C 200	A-2A
C 201	A-2A
C 210	A-5E
C 211	A-4, 5B
C 212	A-5E
C 213	A-5B
C 220	A-4F
C 221	A-4E, F
C 222	A-4F
C 223	A-3E
C 224	A-3E
C 226	A-3E
C 227	A-4D
C 241	A-2C
C 252	A-2G
C 253	A-2G
C 301	A-4D
C 302	A-4D
C 305	A-3D
C 315	A-4D
C 320	A-4B
C 337	A-5A
C 338	A-5A
C 339	A-5A
C 342	A-5B
C 352	A-4A
C 355	A-2, 3B
C 361	A-2G
C 367	A-5E
C 368	A-5D
C 369	A-4C
C 370	A-5C
C 372	A-5B
C 374	A-1A
C 404	A-3C

CAPACITOR

SYMBOL	ADDRESSE
C 409	A-3B
C 410	A-3D
C 411	A-3D
C 414	A-3, 4D
C 419	A-4C, D
C 421	A-4C
C 423	A-5C
C 424	A-5C
C 426	A-4C
C 427	A-4C
C 428	A-3B
C 429	A-3C
C 430	A-3B
C 432	A-3B
C 433	A-3B
C 435	A-3B
C 451	A-3B
C 453	A-3A
C 457	A-4B, C
C 466	A-4B
C 502	A-3B

COIL

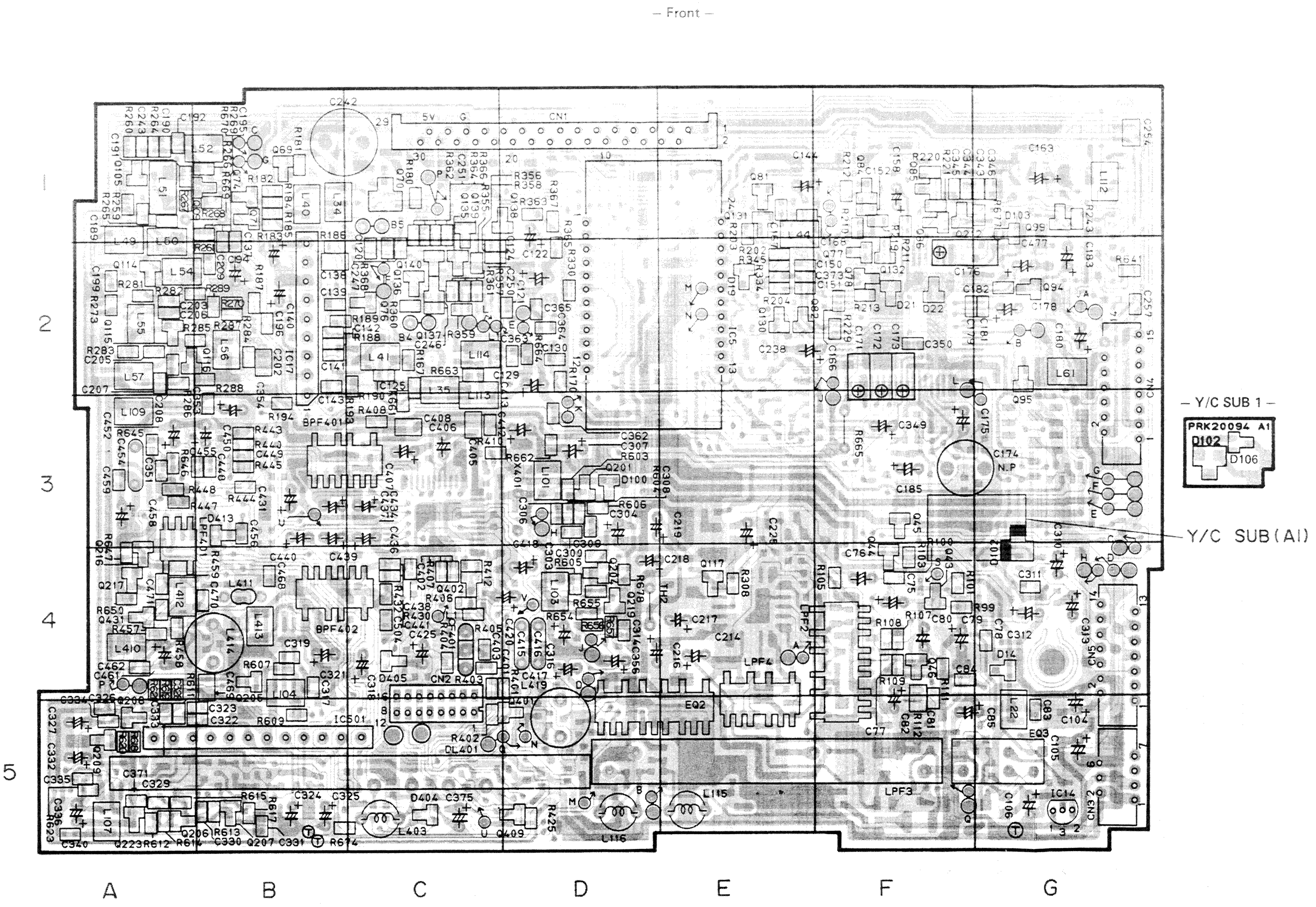
SYMBOL	ADDRESSE
L 21	A-4F
L 27	A-5G
L 28	A-1C
L 29	A-1B, C
L 30	A-1B
L 31	A-1B
L 32	A-1B
L 37	A-2D
L 39	A-2C
L 42	A-1F
L 43	A-1G
L 47	A-2B
L 48	A-2A
L 53	A-2A
L 58	A-3, 4E
L 60	A-2A, B
L 100	A-3D
L 102	A-3, 4F, G
L 105	A-5B
L 106	A-4, 5B
L 108	A-5A
L 110	A-2, 3C
L 117	A-1A
L 401	A-3D
L 402	A-3B
L 404	A-5C
L 406	A-3A

TEST PIN

SYMBOL	ADDRESSE
TP 3	A-1G
TP 4	A-1B
TP 11	A-1C
TP 15	A-1D
TP 22	A-1F
TP 23	A-1, 2G
TP 24	A-1, 2G
TP 25	A-2C
TP 26	A-4E
TP 27	A-4E
TP 28	A-4F
TP 29	A-2G
TP 30	A-2G
TP 104	A-1A
TP 403	A-3C
TP 404	A-4B
TP 411	A-4C
TP 422	A-3B
TP 426	A-4A
TP 500	A-5B
TP 501	A-5A
TP 502	A-1C
TP 503	A-5B
TP 504	A-5B

Note: Address of chip parts

A-2B
- 2B — Address
- A — A : Rear
  - B : Front


– Front –
– Y/C SUB 1 –
PRK20094 A1
D102
D106
Y/C SUB(AI)
CN1
5V
G
29
30
20
10
2
1
C242
CN2
CN4
CN5
CN32
IC501
IC5
IC14
BPF401
BPF402
LPF401
LPF2
LPF3
LPF4
EQ2
EQ3
DL401
L115
L116
L403
C174
N.P
1
2
3
4
5
A
B
C
D
E
F
G

I	J	K		4-19	4-19	N	O	P

■ INDEX OF CHIP PARTS ADDRESS TO FRONT SIDE

TRANSISTOR	
SYMBOL	ADDRESSE
Q 43	B-4F
Q 44	B-4F
Q 45	B-3F
Q 46	B-4F
Q 69	B-1B
Q 70	B-1C
Q 74	B-1B
Q 76	B-2C
Q 77	B-2F
Q 78	B-2F
Q 81	B-1E
Q 82	B-2E
Q 84	B-1F
Q 85	B-1F
Q 86	B-1F
Q 94	B-2G
Q 95	B-2, 3G
Q 99	B-1G
Q 105	B-1A
Q 109	B-1, 2A
Q 114	B-2A
Q 115	B-2A
Q 116	B-2A, B
Q 117	B-4E
Q 131	B-1E
Q 135	B-2C
Q 136	B-2C
Q 137	B-2C
Q 138	B-1C, D
Q 139	B-1, 2C
Q 140	B-2C
Q 201	B-3D
Q 204	B-4D
Q 205	B-4B
Q 206	B-5A
Q 207	B-5B
Q 208	B-5A
Q 209	B-5A
Q 212	B-1F
Q 216	B-3, 4A
Q 217	B-4A
Q 219	B-4D
Q 223	B-5A
Q 401	B-5C, D
Q 402	B-4C
Q 409	B-5C, D
Q 431	B-4A

RESISTOR	
SYMBOL	ADDRESSE
R 99	B-4F
R 100	B-4F
R 101	B-4F
R 103	B-4F
R 105	B-4F
R 107	B-4F
R 109	B-4F
R 111	B-4F
R 112	B-4, 5F
R 167	B-2C
R 170	B-2D

RESISTOR	
SYMBOL	ADDRESSE
R 180	B-1C
R 181	B-1B
R 182	B-1B
R 183	B-1B
R 185	B-1B
R 186	B-2B
R 187	B-2B
R 188	B-2B
R 189	B-2B
R 190	B-2C
R 193	B-2, 3B, C
R 194	B-3B
R 202	B-2E
R 203	B-1, 2E
R 204	B-2E
R 210	B-1F
R 211	B-1F
R 212	B-1F
R 213	B-2F
R 219	B-1F
R 220	B-1F
R 221	B-1F
R 243	B-1G
R 259	B-1A
R 260	B-1A
R 261	B-2A, B
R 264	B-1A
R 265	B-1A
R 266	B-1A, B
R 267	B-1A
R 268	B-1B
R 270	B-2B
R 273	B-2A
R 281	B-2A
R 282	B-2A, B
R 283	B-2A
R 284	B-2B
R 285	B-2A, B
R 286	B-2A
R 287	B-2B
R 288	B-2A, B
R 289	B-2B
R 308	B-4E
R 330	B-2D
R 345	B-2E
R 355	B-2C
R 356	B-2C
R 357	B-2C
R 358	B-2C
R 359	B-2C
R 360	B-2C
R 361	B-2C
R 362	B-1, 2C
R 363	B-1D
R 364	B-1, 2C
R 365	B-2D
R 366	B-1, 2C
R 367	B-1D
R 368	B-2C
R 401	B-4, 5C, D
R 402	B-5C
R 403	B-4, 5C
R 404	B-4C
R 405	B-4C
R 406	B-4C

RESISTOR	
SYMBOL	ADDRESSE
R 407	B-4C
R 408	B-3C
R 410	B-3C
R 412	B-4C
R 425	B-5D
R 430	B-4C
R 432	B-4C
R 440	B-3B
R 443	B-3B
R 444	B-3B
R 447	B-3A
R 448	B-3A
R 457	B-4A
R 458	B-4A
R 459	B-4A
R 603	B-3D
R 604	B-3D
R 605	B-4D
R 606	B-3D
R 607	B-4D
R 609	B-5B
R 611	B-5A
R 612	B-5A
R 613	B-5B
R 614	B-5A
R 615	B-5A
R 617	B-5B
R 618	B-5A
R 619	B-4, 5A
R 620	B-5A
R 621	B-4, 5A
R 623	B-5A
R 641	B-2G
R 645	B-3A
R 646	B-3A
R 647	B-3, 4A
R 650	B-4A
R 654	B-4D
R 655	B-4D
R 656	B-4D
R 657	B-4D
R 661	B-3C
R 663	B-2C
R 664	B-2D
R 670	B-1, 2B
R 674	B-5B, C
R 677	B-1F, G
R 678	B-4D

CAPACITOR	
SYMBOL	ADDRESSE
C 78	B-4G
C 81	B-4, 5F
C 83	B-5G
C 84	B-4F
C 120	B-2C
C 121	B-2C, D
C 125	B-2, 3C
C 130	B-2D
C 138	B-2B
C 139	B-2B

CAPACITOR	
SYMBOL	ADDRESSE
C 141	B-2B
C 142	B-2B
C 143	B-2B
C 150	B-2E
C 151	B-2E
C 152	B-1F
C 166	B-2F
C 167	B-1E
C 168	B-1E
C 171	B-2, 3F
C 172	B-2, 3F
C 173	B-2, 3F
C 176	B-2F, G
C 181	B-2G
C 182	B-2G
C 189	B-1A
C 190	B-1A
C 191	B-1A
C 192	B-1A
C 195	B-1, 2B
C 196	B-2B
C 199	B-2A
C 202	B-2B
C 202	B-2A
C 203	B-2A
C 205	B-2A
C 206	B-2A
C 207	B-2B
C 208	B-2A
C 209	B-2C
C 246	B-2C
C 247	B-2C
C 250	B-1, 2C
C 251	B-1G
C 254	B-1G
C 257	B-2G
C 300	B-3D
C 303	B-4D
C 306	B-3D
C 308	B-3D
C 309	B-3D
C 311	B-4G
C 314	B-4D
C 317	B-4B
C 319	B-4B
C 322	B-5A, B
C 323	B05A, B
C 326	B-5A
C 329	B-5A
C 330	B-5A, B
C 331	B-5B
C 333	B-5A
C 334	B-5A
C 335	B-5A
C 340	B-5A
C 343	B-1F, G
C 344	B-1F
C 345	B-1F
C 346	B-1G
C 350	B-2F
C 351	B-3A
C 353	B-3B
C 362	B-3D
C 363	B-2D
C 364	B-2D

CAPACITOR	
SYMBOL	ADDRESSE
C 365	B-2D
C 371	B-5A
C 401	B-4C
C 402	B-4C
C 403	B-4C
C 405	B-3C
C 408	B-3C
C 412	B-3C
C 415	B-4D
C 416	B-4D
C 438	B-4C
C 441	B-4C
C 448	B-3B
C 449	B-3B
C 454	B-3A
C 455	B-3A, B
C 456	B-3B
C 459	B-3A
C 462	B-4A
C 468	B-4B
C 469	B-4, 5B
C 470	B-4B
C 471	B-4A
C 504	B-4C

DIODE	
SYMBOL	ADDRESSE
D 14	B-4G
D 19	B-2E
D 21	B-2F
D 22	B-2F
D 100	B-3D
D 102	Y/C SUB (A1)
D 103	B-1, 2G
D 106	Y/C SUB (A1)
D 404	B-5C
D 405	B-4C
D 413	B-3B

COIL	
SYMBOL	ADDRESSE
L 22	B-4, 5G
L 34	B-1B, C
L 35	B-2, 3C
L 40	B-1B
L 41	B-2C
L 44	B-1, 2E
L 49	B-1, 2A
L 50	B-1, 2A
L 51	B-1A
L 52	B-1A, B
L 54	B-2A, B
L 55	B-2A
L 56	B-2B
L 57	B-2A
L 61	B-2G
L 101	B-3D
L 103	B-4D
L 104	B-4, 5B
L 107	B-5A
L 109	B-3A
L 112	B-1G
L 113	B-2, 3C
L 114	B-2C
L 410	B-4A
L 412	B-4A
L 413	B-4B

LOW PASS FILTER	
SYMBOL	ADDRESSE
LPF 2	B-4, 5E, F
LPF 4	B-4, 5E
LPF401	B-3, 4A

BAND PASS FILTER	
SYMBOL	ADDRESSE
BPF401	B-3B, C
BPF402	B-4B, C

EQUALIZER	
SYMBOL	ADDRESSE
EQ 2	B-4, 5E

Note: Address of chip parts

A-2B

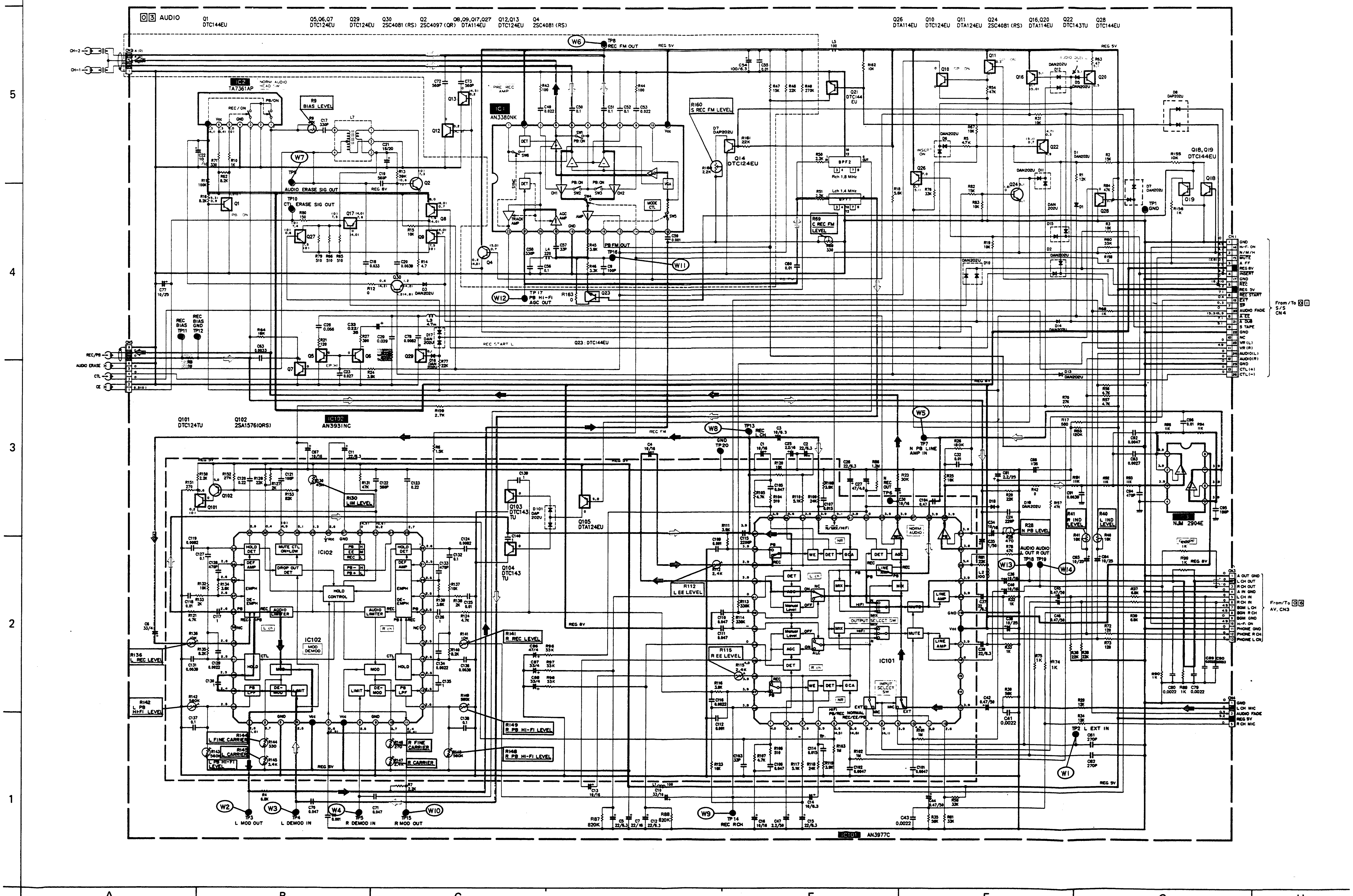
└── Address

└── A : Rear

B : Front

4.14 AUDIO SCHEMATIC DIAGRAM

Note: R162, R163, Q21, Q23 and D8 are located on the PROT/EP S/N board.


03 AUDIO
IC1 AN3380NK
IC2 TA7361AP
IC101 AN3977C
IC102 AN3931NC
NJM 2904E
R9 BIAS LEVEL
R160 S REC FM LEVEL
R69 C REC FM LEVEL
R130 LIM LEVEL
R112 L EE LEVEL
R115 R EE LEVEL
R136 L REC LEVEL
R141 R REC LEVEL
R142 L PB HI-FI LEVEL
R149 R PB HI-FI LEVEL
R148 R PB HI-FI LEVEL
R144 L FINE CARRIER
R145 L CARRIER
R146 R FINE CARRIER
R147 R CARRIER
R28 N PB LEVEL
R41 R IND LEVEL
R40 L IND LEVEL
TP6 REC FM OUT
TP16 PB FM OUT
TP17 PB HI-FI AGC OUT
TP10 CTL ERASE SIG OUT
AUDIO ERASE SIG OUT
TP13 REC L CH
TP20 GND
TP7 N PB LINE AMP IN
TP18 TP19 AUDIO OUT L / AUDIO OUT R
TP2 L EXT IN
TP3 L MOD OUT
TP4 L DEMOD IN
TP5 R DEMOD IN
TP15 R MOD OUT
TP14 REC R CH
TP1 GND
REC BIAS TP11
REC GND TP12
From/To 01 S/S CN4
From/To 06 AV, CN3
A
B
C
D
E
F
G
H
1
2
3
4
5
6

■ INDEX OF CHIP PARTS ADDRESS TO REAR SIDE

IC

SYMBOL	ADDRESSE
IC 3	A-4H, I

TRANSISTOR

SYMBOL	ADDRESSE
Q 1	A-3, 4G
Q 2	A-4E
Q 4	A-3B
Q 5	A-4G
Q 6	A-4G
Q 7	A-4G
Q 10	A-2E
Q 11	A-2E
Q 12	A-2, 3B
Q 13	A-2B
Q 18	A-4C
Q 27	A-3F
Q 103	A-1, 2F
Q 104	A-2F
Q 105	A-2G

DIODE

SYMBOL	ADDRESSE
D 16	A-2, 3G
D 17	A-3G
D 101	A-1F

RESISTOR

SYMBOL	ADDRESSE
R 4	A-3I
R 6	A-3H
R 7	A-3I
R 8	A-4E
R 9	A-4E
R 10	A-3G
R 13	A-4E
R 14	A-4E
R 15	A-2E
R 16	A-3G
R 20	A-4G
R 22	A-3H
R 24	A-4G
R 27	A-4G
R 28	A-4E
R 29	A-2A
R 32	A-2C
R 33	A-3C
R 34	A-2A
R 40	A-4A
R 41	A-4A
R 43	A-2B
R 44	A-2B
R 45	A-2B
R 46	A-3B
R 50	A-2C
R 54	A-2E
R 58	A-1D
R 61	A-1D
R 62	A-3G
R 63	A-4A
R 64	A-4G
R 69	A-2D
R 73	A-2B
R 74	A-2B
R 75	A-2B
R 77	A-3G, H
R 86	A-4F, G
R 87	A-4G
R 88	A-4H

RESISTOR

SYMBOL	ADDRESSE
R 91	A-4I
R 92	A-4I
R 93	A-4H
R 94	A-4H
R 95	A-4H
R 96	A-4F
R 97	A-4G
R 108	A-2F
R 110	A-2F
R 111	A-2F
R 112	A-2G
R 113	A-2F
R 114	A-1F
R 115	A-1G
R 116	A-1G
R 117	A-1F
R 119	A-1F
R 120	A-2F
R 121	A-2G
R 123	A-1G
R 124	A-2G
R 130	A-1, 2G
R 132	A-2I
R 133	A-2I
R 134	A-2I
R 135	A-1I
R 136	A-2I
R 137	A-2H
R 138	A-2H
R 139	A-2H
R 140	A-2H
R 141	A-1, 2I
R 142	A-1, 2I, J
R 143	A-1I, J
R 144	A-1H, I
R 145	A-1H
R 146	A-1H
R 147	A-1G
R 148	A-1G
R 149	A-1H
R 158	A-3F
R 160	A-1, 2D

CAPACITOR

SYMBOL	ADDRESSE
C 138	A-1, 2H
C 139	A-1F
C 140	A-2F

TEST POINT

SYMBOL	ADDRESSE
TP 1	A-3C
TP 2	A-2D
TP 3	A-3I
TP 4	A-3H, I
TP 5	A-3, 4H, I
TP 6	A-4F, G
TP 7	A-1F
TP 8	A-3, 4A
TP 9	A-4E
TP 10	A-3E
TP 11	A-4E
TP 12	A-4E
TP 13	A-3I
TP 14	A-1F
TP 15	A-4H
TP 16	A-3C
TP 17	A-2C
TP 18	A-2C
TP 19	A-2D
TP 20	A-2, 3I

CAPACITOR

SYMBOL	ADDRESSE
C 7	A-1I
C 8	A-3I
C 9	A-2, 3B
C 10	A-3, 4I
C 19	A-4E
C 20	A-4E
C 21	A-4F
C 22	A-4F
C 23	A-4G
C 24	A-4G
C 25	A-4F
C 28	A-3H
C 29	A-3H
C 33	A-2F
C 38	A-1E
C 47	A-4H
C 49	A-2B
C 50	A-2B
C 51	A-2, 3B
C 52	A-3B
C 53	A-3B
C 55	A-4B
C 56	A-2B
C 57	A-2B
C 59	A-3B
C 60	A-2C
C 61	A-2D
C 62	A-2D
C 63	A-4G
C 68	A-4F
C 70	A-3H
C 71	A-3H
C 72	A-3B
C 73	A-2B
C 78	A-3H
C 90	A-2B
C 91	A-4H
C 92	A-4H, I
C 93	A-4I
C 94	A-4H
C 95	A-4H
C 96	A-4H
C 107	A-2F
C 109	A-2F
C 110	A-2F
C 111	A-1, 2F
C 112	A-1F
C 114	A-1F
C 115	A-2F
C 116	A-1G
C 117	A-2G
C 118	A-1, 2I
C 119	A-2I
C 124	A-2H
C 125	A-2H
C 126	A-2G
C 127	A-2I
C 128	A-2I
C 129	A-2I
C 131	A-1, 2I
C 132	A-2H
C 133	A-2H
C 134	A-1H
C 136	A-1H
C 137	A-2J

COIL

SYMBOL	ADDRESSE
L 1	A-1D
L 2	A-2E
L 5	A-3, 4C

■ INDEX OF CHIP PARTS ADDRESS TO FRONT SIDE

IC

SYMBOL	ADDRESSE
IC 101	B-1, 2F, G
IC 102	B-1, 2H, I

TRANSISTOR

SYMBOL	ADDRESSE
Q 9	3-3G
Q 14	B-2D
Q 16	B-3G, H
Q 17	B-3G
Q 19	B-4C
Q 20	B-3, 4A
Q 22	B-3H
Q 24	B-3H
Q 26	B-3G, H
Q 28	B-3E
Q 29	B-3G, H
Q 30	B-3F
Q 101	B-2G, H
Q 102	B-1G

DIODE

SYMBOL	ADDRESSE
D 1	B-3G
D 2	B-3G, H
D 3	B-3F, G
D 5	B-3, 4A
D 6	B-3H
D 7	B-3, 4H
D 10	B-3G
D 11	B-3H
D 12	B-3H
D 13	B-3F
D 14	B-3G, H
D 15	B-3G
D 18	B-3E, F

COIL

SYMBOL	ADDRESSE
L 4	B-2B
L 7	B-4D

B P F

SYMBOL	ADDRESSE
BPF 1	B-3C
BPF 2	B-3, 4D

RESISTOR

SYMBOL	ADDRESSE
R 1	B-3G
R 2	B-3H
R 3	B-3G
R 5	B-3H
R 11	B-3F
R 12	B-3E
R 17	B-3E, F
R 18	B-3F
R 19	B-2G
R 21	B-3, 4G
R 23	B-4F
R 25	B-2F
R 26	B-3F
R 30	B-2A
R 31	B-3G
R 35	B-2A
R 36	B-2C
R 37	B-2C
R 38	B-2C
R 39	B-2C
R 42	B-2F
R 47	B-4B
R 48	B-4B
R 49	B-4B
R 51	B-2, 3C
R 53	B-3E, F
R 56	B-4A
R 57	B-4A
R 60	B-3H
R 65	B-3G
R 66	B-3G
R 67	B-3G
R 68	B-4A
R 70	B-3H
R 71	B-4E
R 72	B-2, 3C
R 76	B-3G
R 78	B-2E
R 79	B-3F
R 80	B-3F
R 81	B-2E
R 82	B-3H
R 83	B-3H
R 84	B-3D
R 89	B-2B
R 90	B-2B
R 98	B-4H
R 99	B-1B
R 100	B-1B
R 101	B-1E, F
R 102	B-1F
R 103	B-2, 3H
R 104	B-2G
R 105	B-2G
R 106	B-1G
R 107	B-1G
R 109	B-2F
R 118	B-1F, G
R 127	B-2I
R 128	B-1G
R 131	B-1G, H
R 150	B-1G, H
R 151	B-2H
R 152	B-1, 2G
R 153	B-2G
R 155	B-4C
R 156	B-4C
R 157	B-2E
R 159	B-3H
R 161	B-2D

CAPACITOR

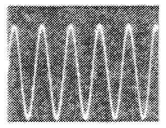
SYMBOL	ADDRESSE
C 1	B-4G
C 2	B-4G
C 3	B-4I
C 4	B-4I
C 5	B-4G
C 6	B-4I
C 11	B-4H
C 12	B-4H
C 13	B-4H
C 14	B-4I
C 15	B-4H
C 16	B-4H
C 17	B-4D
C 18	B-4E
C 26	B-4G
C 27	B-4F
C 30	B-4F
C 32	B-2F
C 34	B-4E, F
C 35	B-4F
C 36	B-2C
C 37	B-3, 4C
C 39	B-4D
C 40	B-2, 3C
C 41	B-2A
C 42	B-1, 2A
C 43	B-2A
C 44	B-3A
C 45	B-3, 4C
C 46	B-3, 4C
C 54	B-3, 4B
C 58	B-2B
C 64	B-4D
C 65	B-4C, D
C 67	B-4F
C 77	B-4D
C 79	B-2B
C 80	B-1B
C 81	B-4E
C 86	B-4G
C 87	B-4G
C 88	B-4H
C 89	B-2C
C 101	B-1E, F
C 102	B-1F
C 103	B-3I
C 104	B-2F
C 105	B-2G
C 106	B-1G
C 120	B-2I
C 121	B-2I
C 122	B-2H
C 123	B-2H
C 130	B-1, 2I
C 135	B-1H

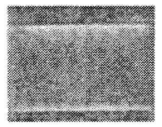
Note: Address of chip parts

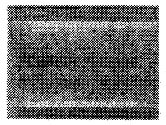
A-2B
- Address
- A : Rear
- B : Front

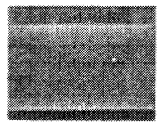
4.15 AUDIO CIRCUIT BOARD

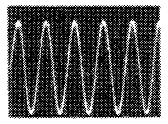
■ WAVEFORMS OF AUDIO CIRCUIT

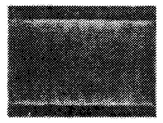
W1

TP2
0.28 Vp-p

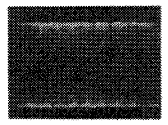
W2

TP3
0.6 Vp-p
[REC]

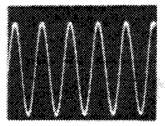
W3

TP4
0.12 Vp-p
[PB]

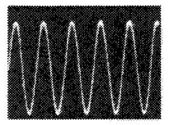
W4

TP5
0.1 Vp-p
[PB]

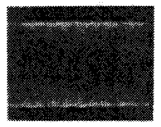
W5

TP7
90 mVp-p
[PB]

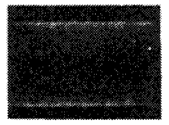
W6

TP8
1.5 Vp-p
[REC]

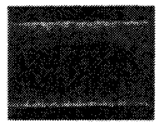
W7

TP9
35 Vp-p
[REC]

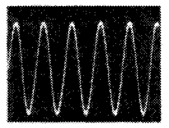
W8

TP13
0.72 Vp-p
[REC]

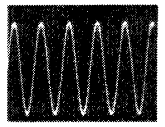
W9

TP14
0.72 Vp-p
[REC]

W10

TP15
0.6 Vp-p
[REC]

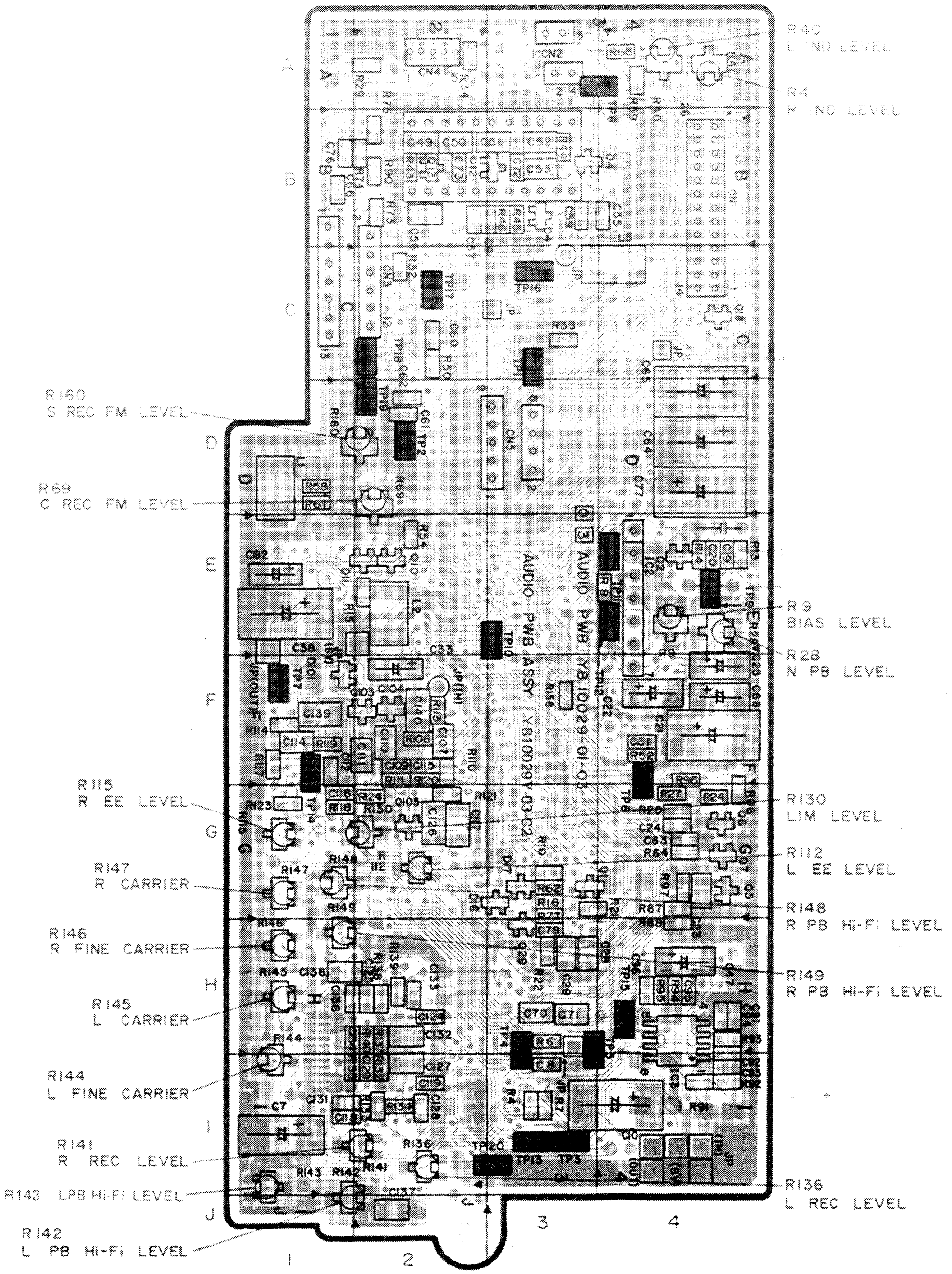
W11

TP16
70 mVp-p
[PB]

W12

TP17
0.4 Vp-p
[PB]

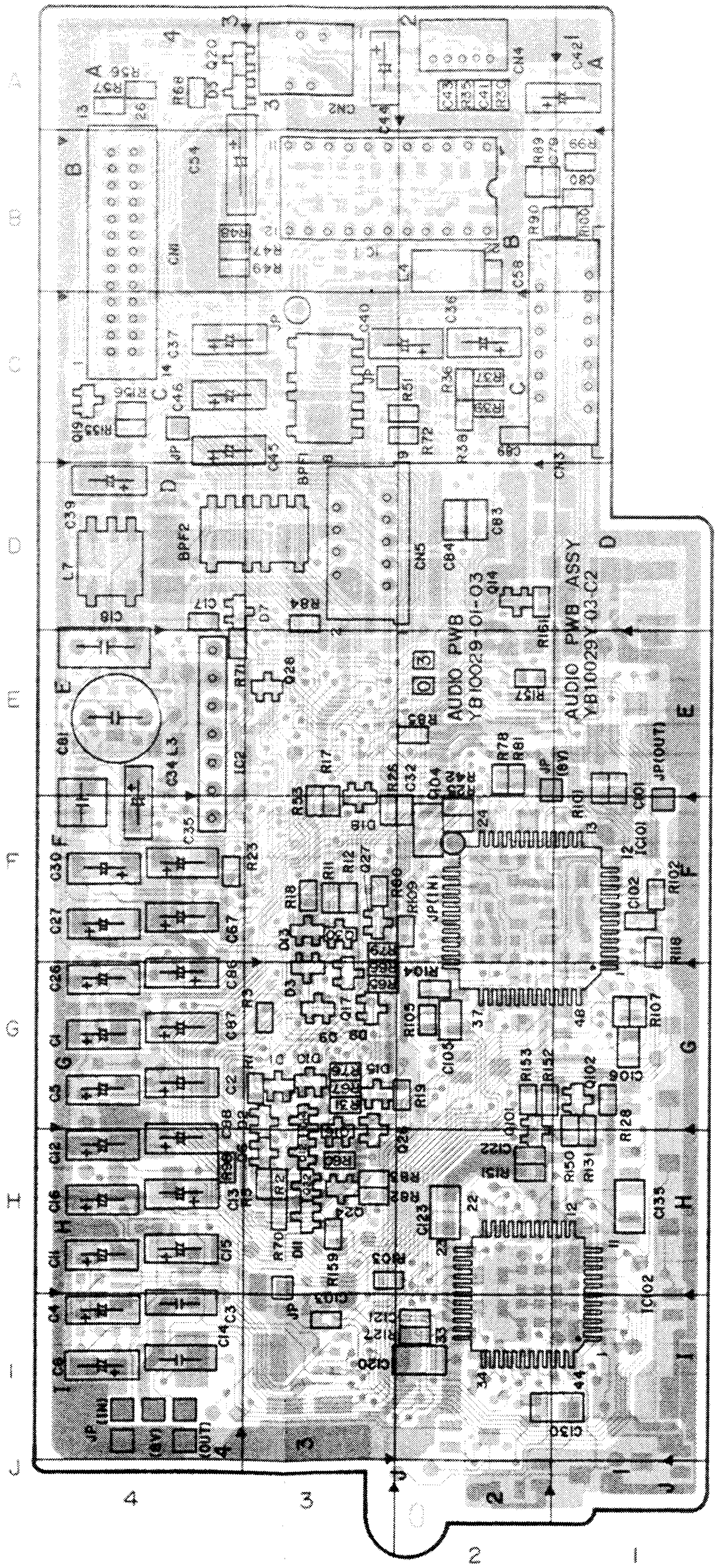
W13

TP18
1.2 Vp-p
[REC]

W14

TP19
1.2 Vp-p
[PB]

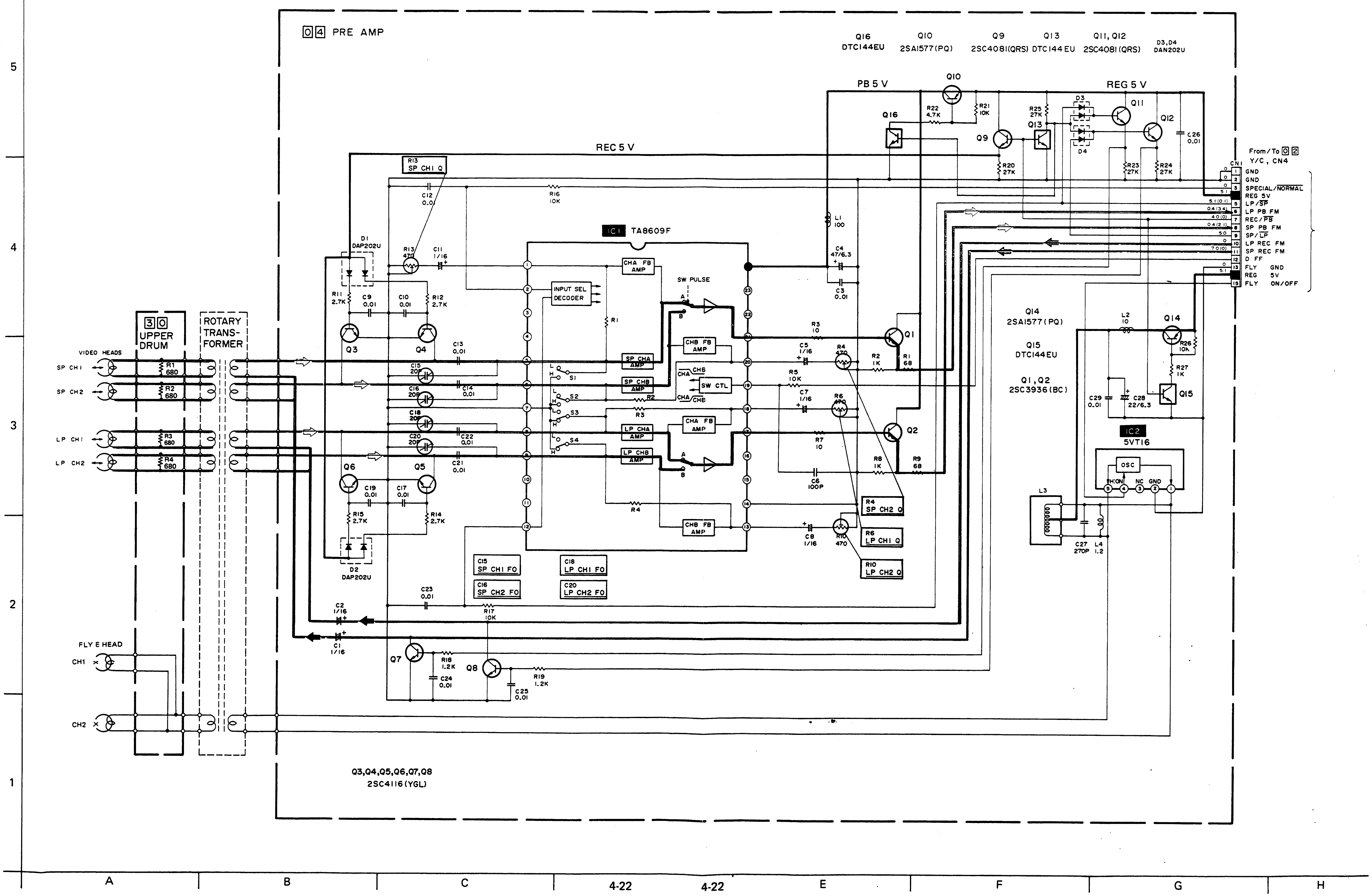
– Rear –


R40
L IND LEVEL
R41
R IND LEVEL
R160
S REC FM LEVEL
R69
C REC FM LEVEL
R9
BIAS LEVEL
R28
N PB LEVEL
AUDIO PWB YB10029-01-03
AUDIO PWB ASSY YB10029Y 03-C2
R115
R EE LEVEL
R130
LIM LEVEL
R112
L EE LEVEL
R147
R CARRIER
R148
R PB Hi-Fi LEVEL
R146
R FINE CARRIER
R149
R PB Hi-Fi LEVEL
R145
L CARRIER
R144
L FINE CARRIER
R141
R REC LEVEL
R136
L REC LEVEL
R143 LPB Hi-Fi LEVEL
R142
L PB Hi-Fi LEVEL
A
B
C
D
E
F
G
H
I
J
1
2
3
4

– Front –


AUDIO PWB
YB10029-01-03
AUDIO PWB ASSY
YB10029Y 03-C2
A
B
C
D
E
F
G
H
I
J
4
3
2
1

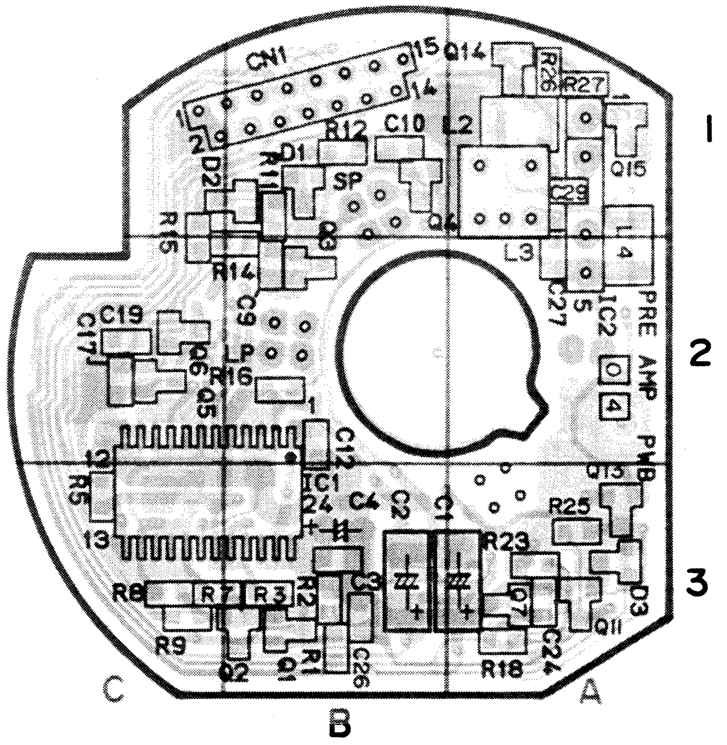
4.16 PRE AMP SCHEMATIC DIAGRAM



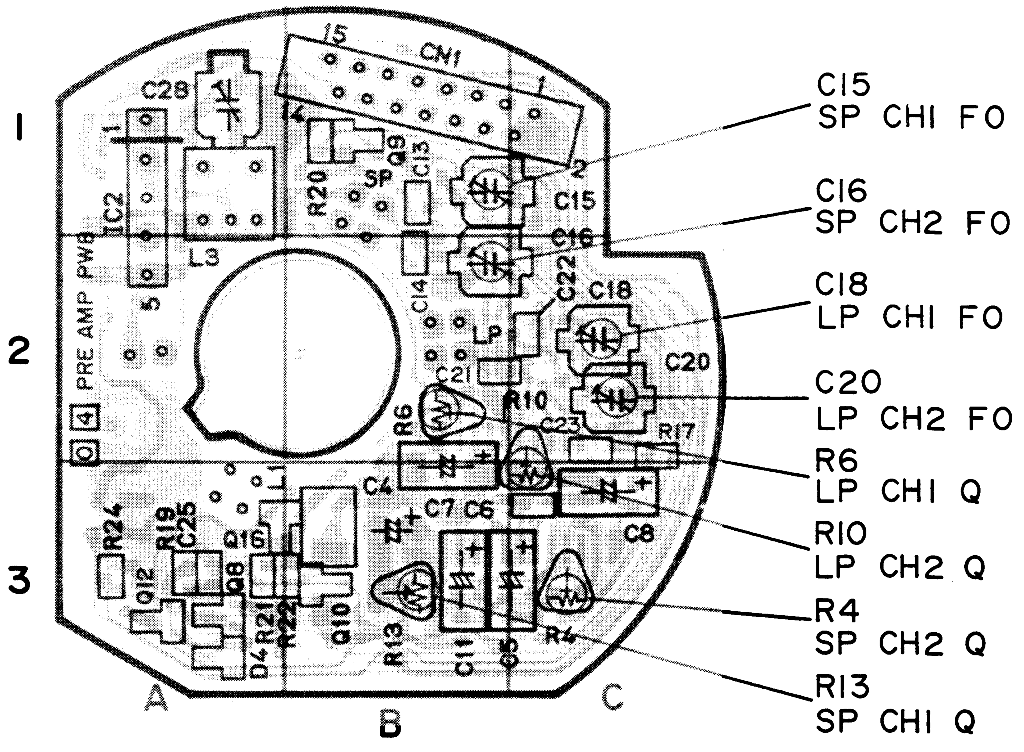
04 PRE AMP
Q16 DTC144EU
Q10 2SA1577(PQ)
Q9 2SC4081(QRS)
Q13 DTC144EU
Q11, Q12 2SC4081(QRS)
D3, D4 DAN202U
PB 5 V
REG 5 V
REC 5 V
Q10
R22 4.7K
R21 10K
R25 27K
Q13
D3
D4
Q11
Q12
C26 0.01
Q9
R20 27K
R23 27K
R24 27K
R13 SP CH1 Q
C12 0.01
R16 10K
L1 100
C4 47/6.3
C3 0.01
IC1 TA8609F
D1 DAP202U
R13 470
C11 1/16
CHA FB AMP
SW PULSE
INPUT SEL DECODER
R1
R11 2.7K
C9 0.01
C10 0.01
R12 2.7K
Q3
Q4
C13 0.01
30 UPPER DRUM
ROTARY TRANS-FORMER
VIDEO HEADS
SP CH1
SP CH2
LP CH1
LP CH2
R1 680
R2 680
R3 680
R4 680
C15 20P
C16 20P
C18 20P
C20 20P
C14 0.01
C22 0.01
C21 0.01
S1
S2
S3
S4
SP CHA AMP
SP CHB AMP
LP CHA AMP
LP CHB AMP
CHB FB AMP
CHA FB AMP
CHB FB AMP
SW CTL
CHA
CHB
CHA/CHB
R2
R3
R4
R3 10
C5 1/16
R4 470
R2 1K
R1 68
R5 10K
C7 1/16
R6 470
R7 10
R8 1K
R9 68
C6 100P
C8 1/16
R10 470
Q1
Q2
R4 SP CH2 Q
R6 LP CH1 Q
R10 LP CH2 Q
Q6
Q5
C19 0.01
C17 0.01
R15 2.7K
R14 2.7K
D2 DAP202U
C15 SP CH1 FO
C16 SP CH2 FO
C18 LP CH1 FO
C20 LP CH2 FO
C23 0.01
R17 10K
C2 1/16
C1 1/16
Q7
R18 1.2K
C24 0.01
Q8
R19 1.2K
C25 0.01
FLY E HEAD
CH1
CH2
Q3, Q4, Q5, Q6, Q7, Q8 2SC4116(YGL)
Q14 2SA1577(PQ)
Q15 DTC144EU
Q1, Q2 2SC3936(BC)
L2 10
Q14
R26 10K
R27 1K
Q15
C29 0.01
C28 22/6.3
IC2 5VT16
OSC
TH:ON
NC
GND
L3
C27 270P
L4 1.2
From/To 02 Y/C, CN4
CN1
1 GND
2 GND
3 SPECIAL/NORMAL
REG 5V
5 LP/SP
6 LP PB FM
7 REC/PB
8 SP PB FM
9 SP/LP
10 LP REC FM
11 SP REC FM
12 D FF
13 FLY GND
REG 5V
15 FLY ON/OFF
0
0
0
5.1
5.1(0.1)
0.4(3.4)
4.0(0)
0.4(2.1)
5.0
0
7.0(0)
0
5.1
6
5
4
3
2
1
A
B
C
4-22
4-22
E
F
G
H

4.17 PRE AMP CIRCUIT BOARD

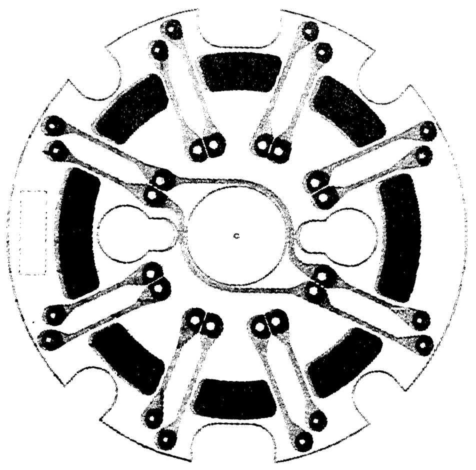
– Rear –


CN1
15
14
1
2
Q14
R26
R27
R12
C10
L2
D1
D2
R11
SP
Q15
C29
R15
Q3
Q4
L3
L4
R14
C9
C27
IC2
5
PRE AMP PWB
C19
C17
Q6
LP
R16
Q5
C12
12
IC1
24
C4
C2
C1
Q13
R25
R5
13
R23
R8
R7
R3
R2
C3
Q7
D3
Q11
R9
Q2
Q1
R1
C26
R18
C24
1
2
3
C
B
A

– Front –


C28
15
CN1
1
14
IC2
Q9
C13
R20
SP
C15
C16
L3
5
PRE AMP PWB
C14
C22
C18
LP
C21
R10
C20
R6
C23
R17
C4
C7
C6
C8
R24
R19
C25
Q16
Q12
Q8
R21
R22
Q10
R13
C11
C5
R4
D4
1
2
3
A
B
C
C15 SP CH1 FO
C16 SP CH2 FO
C18 LP CH1 FO
C20 LP CH2 FO
R6 LP CH1 Q
R10 LP CH2 Q
R4 SP CH2 Q
R13 SP CH1 Q

– UPPER DRUM board –



■ INDEX OF CHIP PARTS ADDRESS TO REAR SIDE

IC	
SYMBOL	ADDRESSE
IC 1	A-2, 3B, C

TRANSISTOR	
SYMBOL	ADDRESSE
Q 1	A-3B
Q 2	A-3B, C
Q 3	A-2B
Q 4	A-1B
Q 5	A-2C
Q 6	A-2C
Q 7	A-3A
Q 11	A-3A
Q 13	A-3A
Q 14	A-1A
Q 15	A-1A

DIODE	
SYMBOL	ADDRESSE
D 1	A-1B
D 2	A-1B, C
D 3	A-3A

COIL	
SYMBOL	ADDRESSE
L 2	A-1A
L 4	A-1, 2A

RESISTOR	
SYMBOL	ADDRESSE
R 1	A-3B
R 2	A-3B
R 3	A-3B
R 5	A-3C
R 7	A-3B, C
R 8	A-3C
R 9	A-3C
R 11	A-1B
R 12	A-1B
R 14	A-2B, C
R 15	A-1, 2C
R 16	A-2B
R 18	A-3A
R 23	A-3A
R 25	A-3A
R 26	A-1A
R 27	A-1A

CAPACITOR	
SYMBOL	ADDRESSE
C 1	A-3A, B
C 2	A-3B
C 3	A-3B
C 9	A-2B
C 10	A-1B
C 12	A-2B
C 17	A-2C
C 19	A-2C
C 24	A-3A
C 26	A-3B
C 27	A-2A
C 29	A-1A

■ INDEX OF CHIP PARTS ADDRESS TO FRONT SIDE

TRANSISTOR	
SYMBOL	ADDRESSE
Q 8	B-3A
Q 9	B-1B
Q 10	B-3B
Q 12	B-3A
Q 16	B-3A, B

DIODE	
SYMBOL	ADDRESSE
D 4	B-3A

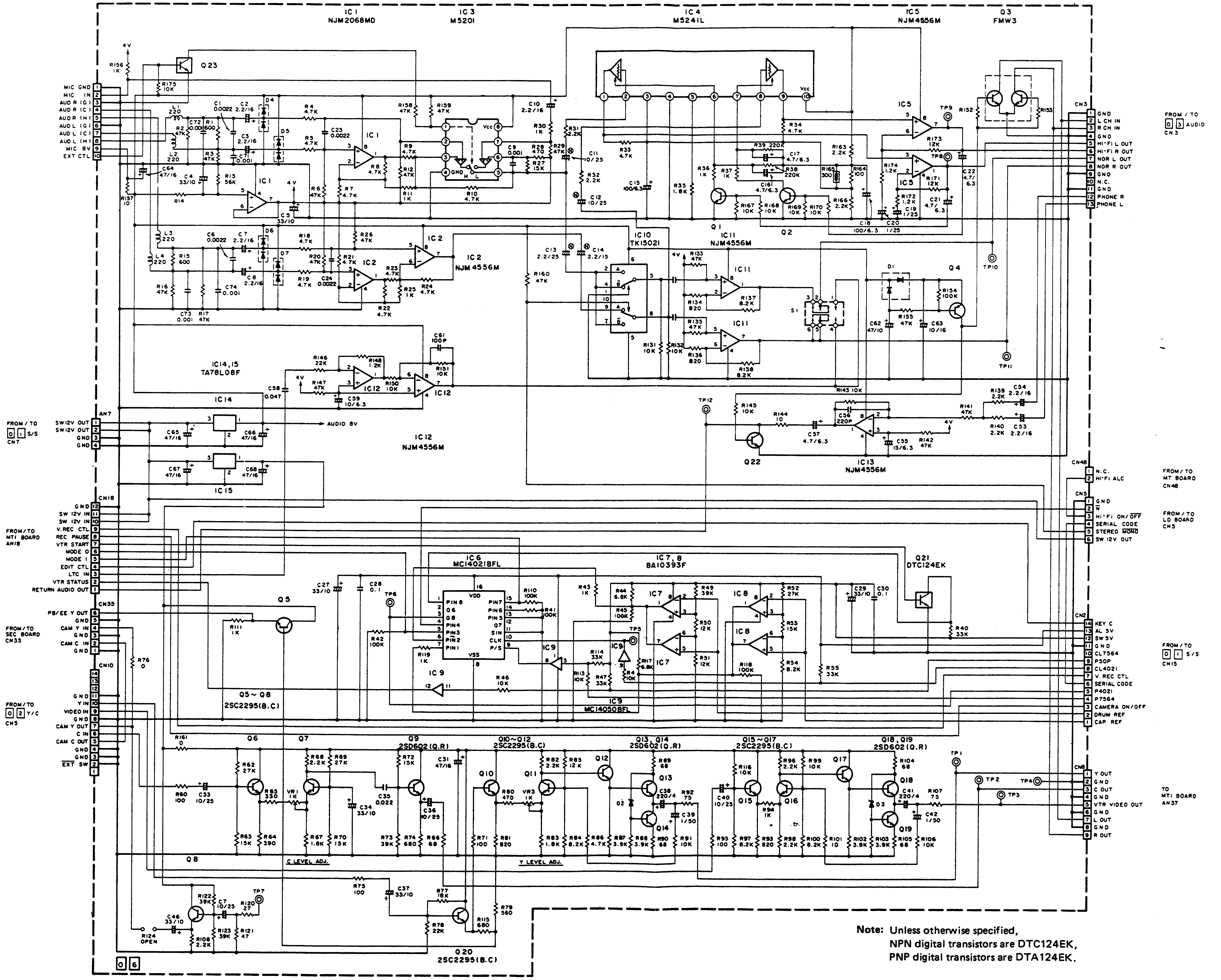
RESISTOR	
SYMBOL	ADDRESSE
R 17	B-2C
R 19	B-3A
R 20	B-1B
R 21	B-3A
R 22	B-3A, B
R 24	B-3A

COIL	
SYMBOL	ADDRESSE
L 1	B-3B

CAPACITOR	
SYMBOL	ADDRESSE
C 5	B-3B, C
C 6	B-3C
C 7	B-2, 3B
C 8	B-3C
C 11	B-3B
C 13	B-1B
C 14	B-1, 2B
C 15	B-1B, C
C 16	B-1, 2B, C
C 18	B-2C
C 20	B-2C
C 21	B-2B, C
C 22	B-2C
C 23	B-2C
C 28	B-1A

Note: Address of chip parts
A-2B
Address
A : Rear
B : Front

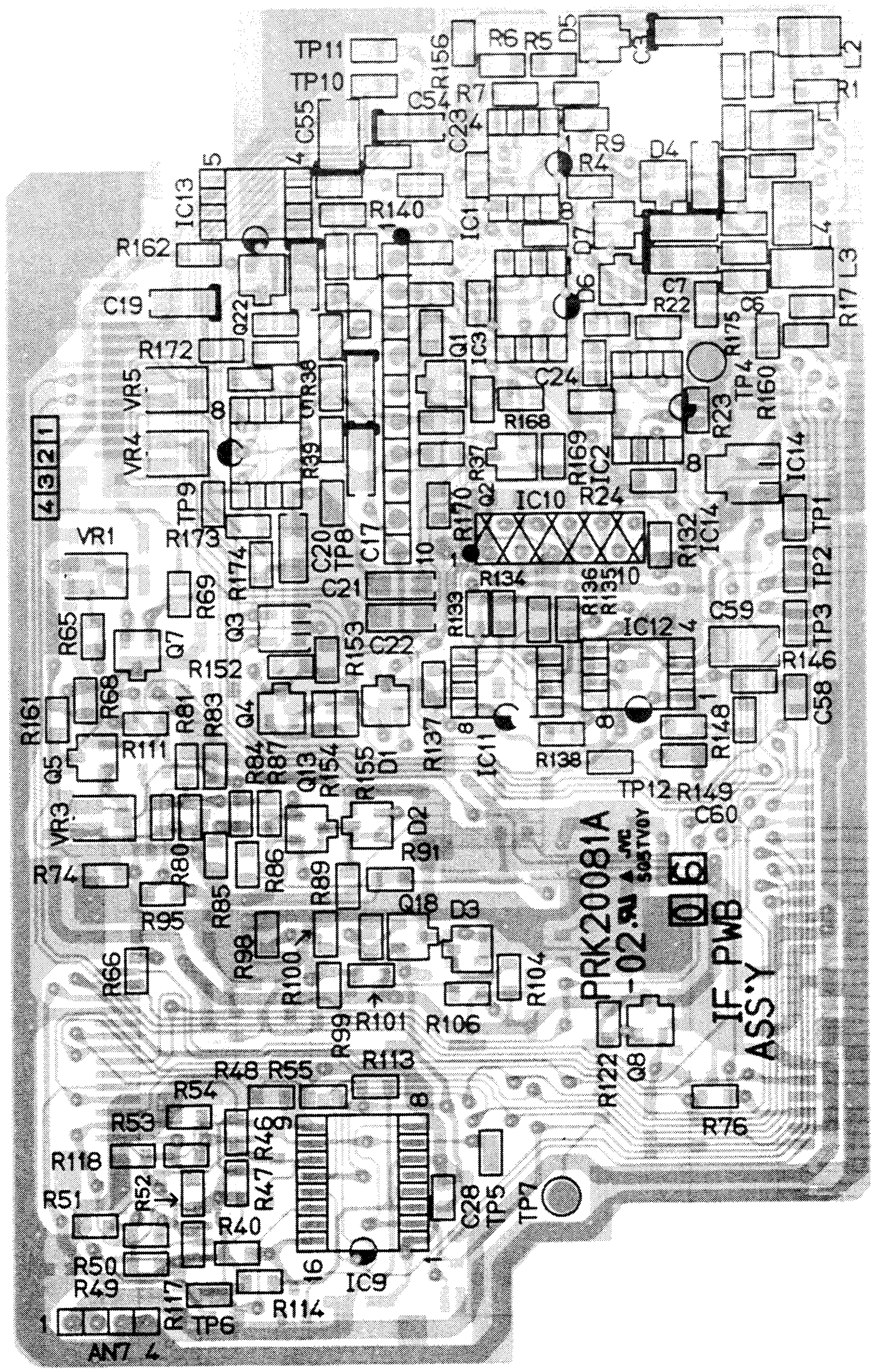
4.18 IF BOARD SCHEMATIC DIAGRAM


IC1 NJM2068MD
IC3 M5201
IC4 M5241L
IC5 NJM4556M
Q3 FMW3
Q23
IC2 NJM4556M
IC10 TK15021
IC11 NJM4556M
Q1
Q2
Q4
D1
S1
IC14,15 TA78L08F
IC14
IC15
IC12 NJM4556M
AUDIO 8V
Q22
IC13 NJM4556M
IC6 MC14021BFL
IC7, 8 BA10393F
Q21 DTC124EK
IC9 MC14050BFL
Q5
Q5~Q8 2SC2295(B.C)
Q6
Q7
Q8
Q9 2SD602(Q.R)
Q10~Q12 2SC2295(B.C)
Q13, Q14 2SD602(Q.R)
Q15~Q17 2SC2295(B.C)
Q18, Q19 2SD602(Q.R)
Q20 2SC2295(B.C)
C LEVEL ADJ.
Y LEVEL ADJ.
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
MIC GND
MIC IN
AUD R (G)
AUD R (C)
AUD R (H)
AUD L (G)
AUD L (C)
AUD L (H)
MIC 8V
EXT CTL
FROM / TO 0 1 S/S CN7
SW12V OUT
SW12V OUT
GND
GND
AN7
CN18
FROM/TO MT1 BOARD AN18
GND
SW 12V IN
SW 12V IN
V.REC CTL
REC PAUSE
VTR START
MODE 0
MODE 1
EDIT CTL
LTC IN
VTR STATUS
RETURN AUDIO OUT
CN35
FROM/TO SEC BOARD CN35
PB/EE Y OUT
GND
CAM Y IN
GND
CAM C IN
GND
CN10
FROM/TO 0 2 Y/C CN5
GND
Y IN
VIDEO IN
GND
CAM Y OUT
C IN
CAM C OUT
GND
GND
EXT SW
CN3
GND
L CH IN
R CH IN
GND
HI-FI L OUT
HI-FI R OUT
NOR L OUT
NOR R OUT
GND
N.C.
GND
PHONE R
PHONE L
FROM / TO 0 3 AUDIO CN3
CN48
N.C.
HI-FI ALC
FROM/TO MT BOARD CN48
CN5
GND
N
HI-FI ON/OFF
SERIAL CODE
STEREO MONO
SW 12V OUT
FROM/TO LD BOARD CN5
CN2
KEY C
AL 5V
SW 5V
GND
CL7564
P50P
CL4021
V. REC CTL
SERIAL CODE
P4021
P7564
CAMERA ON/OFF
DRUM REF
CAP REF
FROM/TO 0 1 S/S CN15
CN6
Y OUT
GND
C OUT
GND
VTR VIDEO OUT
GND
L OUT
GND
R OUT
TO MT1 BOARD AN37
0 6
A
B
C
4-24
4-24
E
F
G
H
1
2
3
4
5
6

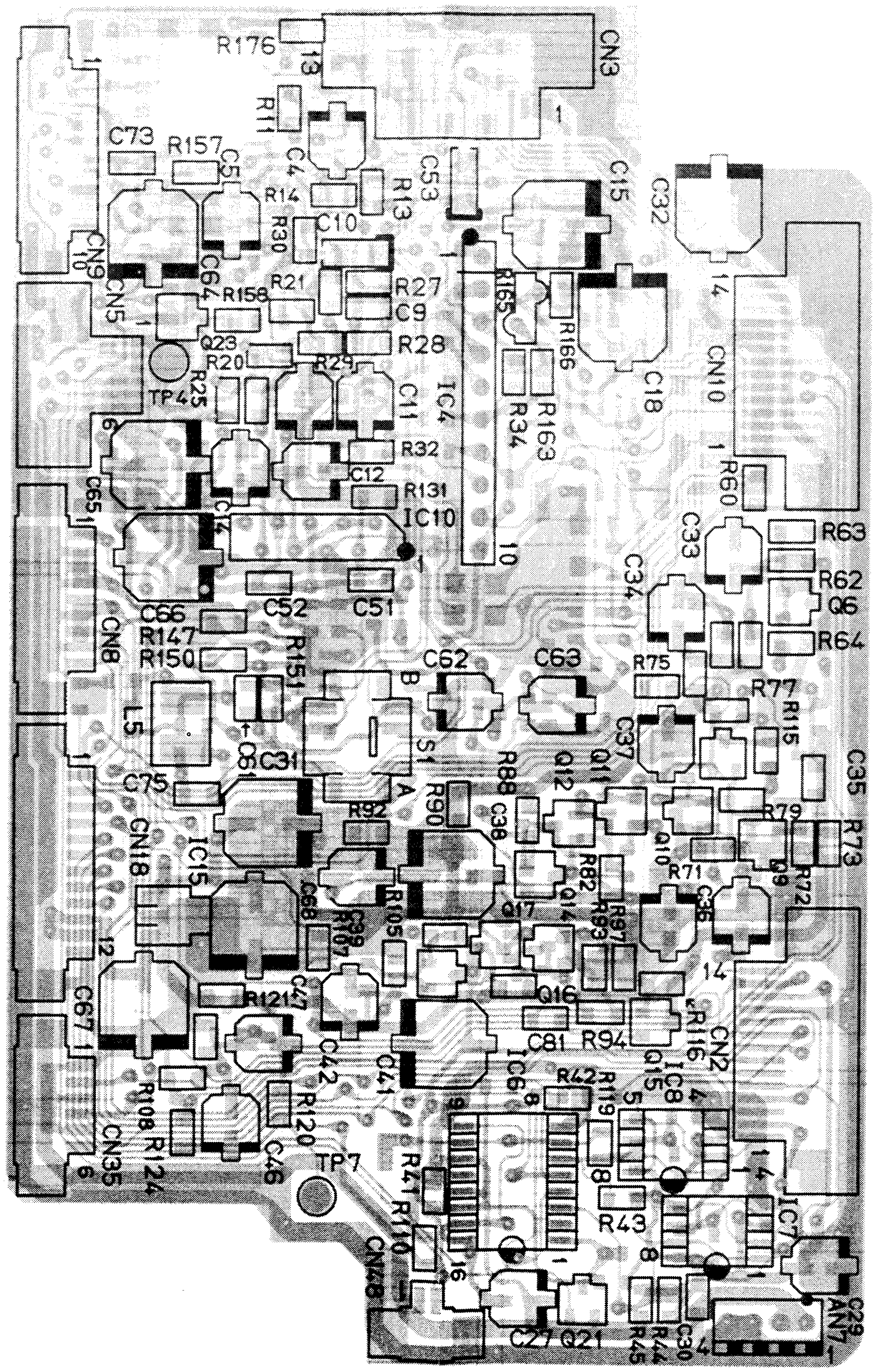
Note: Unless otherwise specified,
NPN digital transistors are DTC124EK,
PNP digital transistors are DTA124EK.

4.19 IF BOARD PARTS LOCATION

– Pattern side –


TP11
TP10
R156
R6 R5
D5
C3
L2
R1
C55
C54
R7
C23
IC13
R140
IC1
R9
R4
D4
R162
D7
D6
L3
R17
C19
Q22
C7
R22
C6
R172
Q1
IC3
R175
TP4
R160
VR5
R38
C24
R168
R169
IC2
R23
VR4
R39
R37
Q2
IC14
TP9
R170
IC10
R24
R132
TP1
VR1
R173
R174
C20
TP8
C17
C21
R134
R136
R135
TP2
R65
R69
Q7
Q3
R133
IC12
C59
TP3
R152
R153
C22
R146
R161
R68
R81
R83
Q4
R137
IC11
R148
C58
Q5
R111
R84
R87
Q13
R154
R155
D1
R138
TP12
R149
C60
VR3
D2
R91
R74
R80
R86
R89
R85
Q18
D3
PRK20081A
-02
06
IF PWB ASS'Y
R95
R98
R100
R66
R99
R101
R106
R104
R122
Q8
R48 R55
R113
R54
R53
R46
R47
R118
R52
R51
R40
C28
TP5
TP7
R76
R50
R49
IC9
R117
TP6
R114
AN7

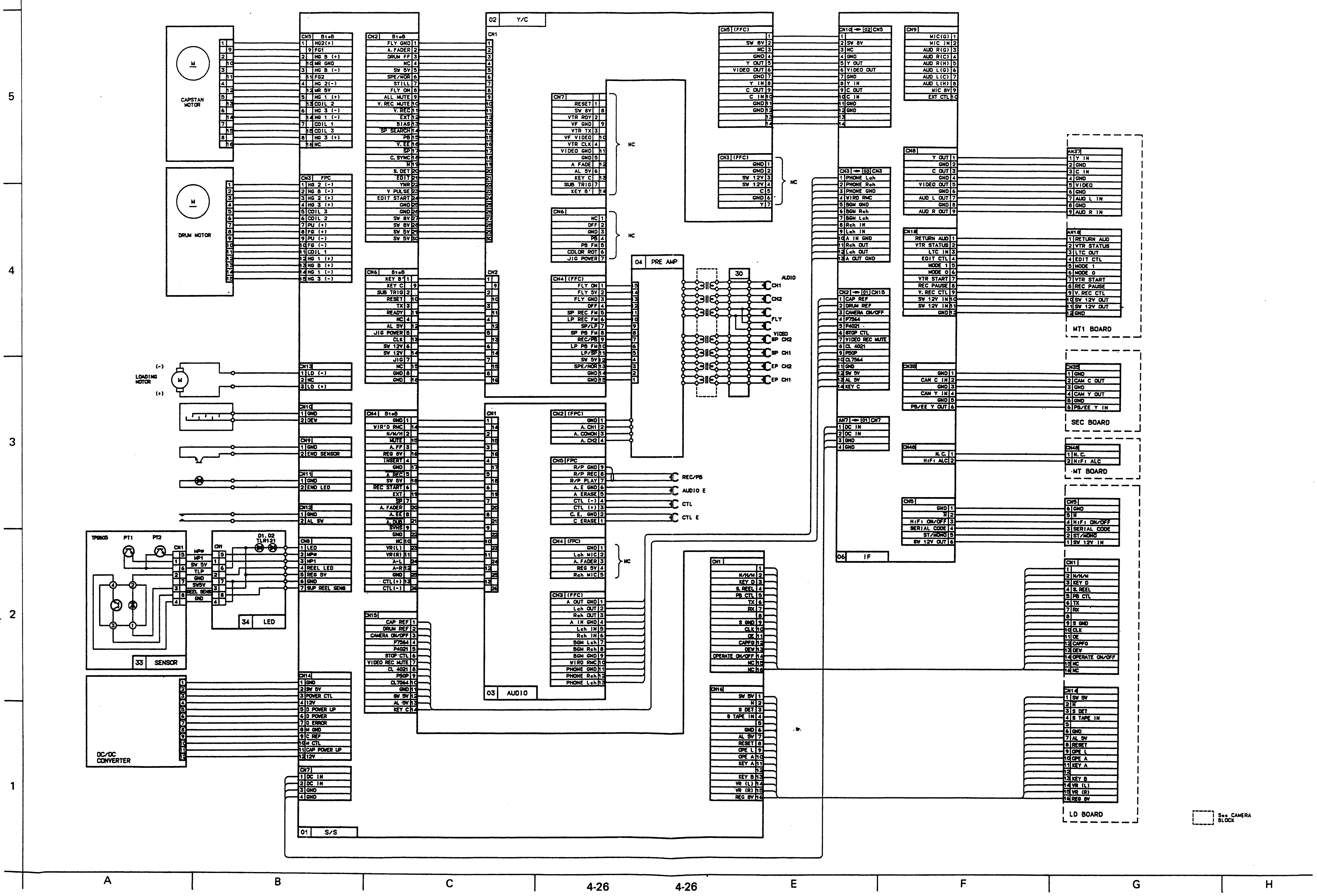
– Parts side –


R176
CN3
R11
C73
R157
C5
C4
R14
R13
C53
C15
C32
R30
C10
CN9
C64
R21
R158
R27
C9
R165
R166
C18
CN5
Q23
R28
R20
R29
CN10
TP4
R25
C11
IC4
R34
R163
R32
C12
R60
R131
IC10
C65
C14
R63
C33
C34
R62
Q6
C66
R147
C52
C51
R64
CN8
R150
R151
C62
C63
R75
R77
R115
L5
C6
C31
R88
Q12
Q11
C37
C35
C75
R90
C36
R79
R73
CN18
IC15
R92
R82
Q14
Q10
R71
R72
C68
R107
C39
R105
Q17
R93
R97
Q9
C38
C67
R121
C47
Q16
C2
R116
C81
R94
Q15
C42
C41
IC6
R42
R119
IC8
R108
R124
R120
CN35
C46
TP7
R41
R43
IC7
R110
CN48
C27
Q21
R45
R44
C30
C29
AN7

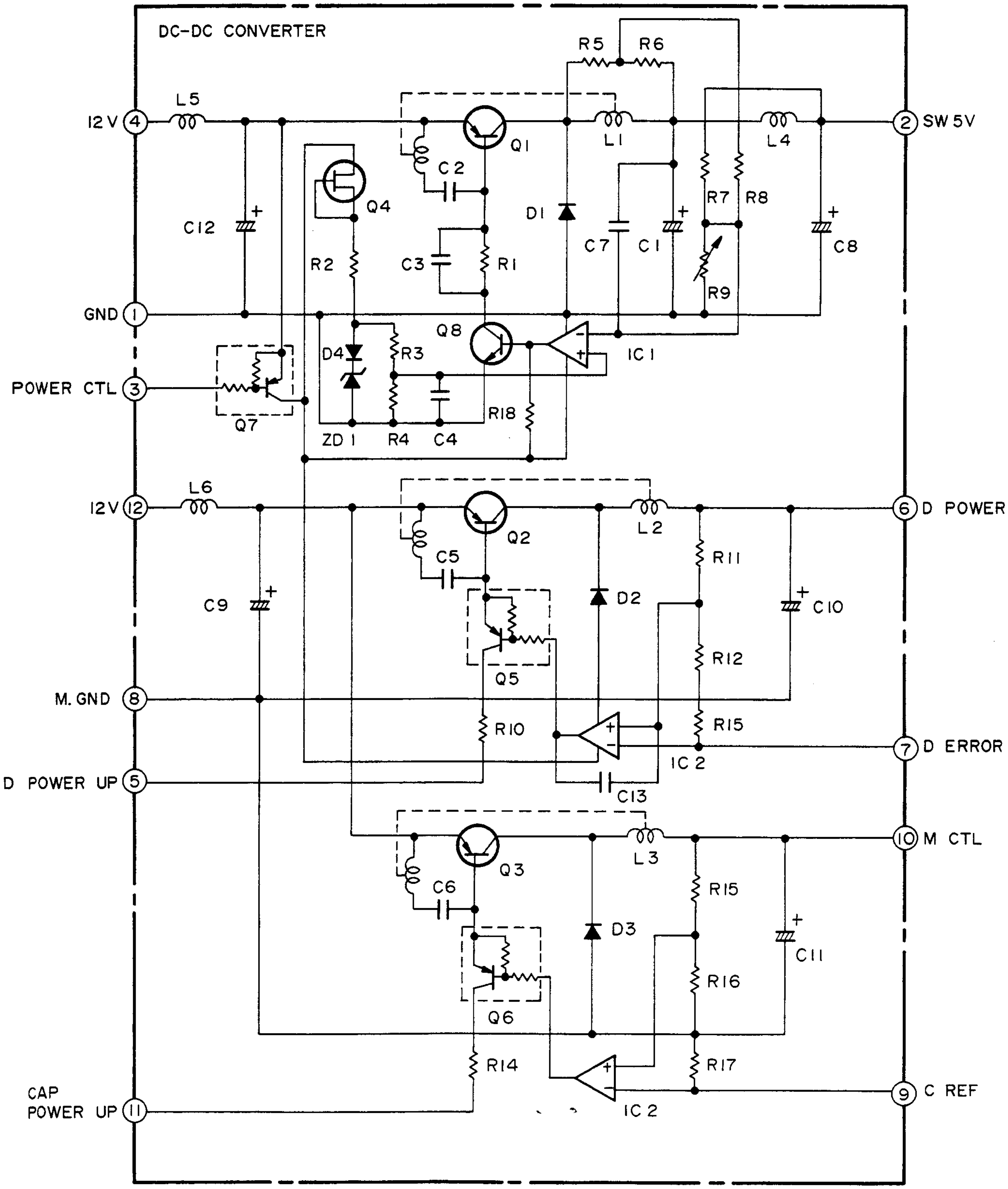
6
5
4
3
2
1

A B C D E F G H

4.20 OVERALL WIRING DIAGRAM


6
5
4
3
2
1
A
B
C
4-26
4-26
E
F
G
H
CAPSTAN MOTOR
DRUM MOTOR
LOADING MOTOR
TPS605
PT1
PT2
33 SENSOR
D1, D2 TLR121
34 LED
DC/DC CONVERTER
01 S/S
02 Y/C
03 AUDIO
04 PRE AMP
30
AUDIO
CH1
CH2
FLY
VIDEO
SP CH2
SP CH1
EP CH2
EP CH1
REC/PB
AUDIO E
CTL
CTL E
NC
06 IF
MT1 BOARD
SEC BOARD
MT BOARD
LD BOARD
See CAMERA BLOCK

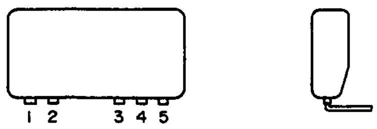
4.21 DC-DC CONVERTER UNIT


DC-DC CONVERTER
12 V ④
L5
GND ①
POWER CTL ③
12 V ⑫
L6
M. GND ⑧
D POWER UP ⑤
CAP POWER UP ⑪
② SW 5V
⑥ D POWER
⑦ D ERROR
⑩ M CTL
⑨ C REF
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R14
R15
R16
R17
R18
L1
L2
L3
L4
D1
D2
D3
D4
ZD 1
IC 1
IC 2
+
−

4.22 IC BLOCK DIAGRAMS

– AFZ72F30A5 –

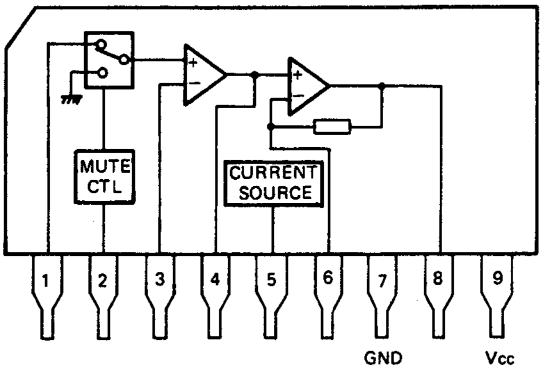
Active Filter



1 INPUT
2 GND
3 (+) INPUT
4 (–) INPUT
5 OUTPUT

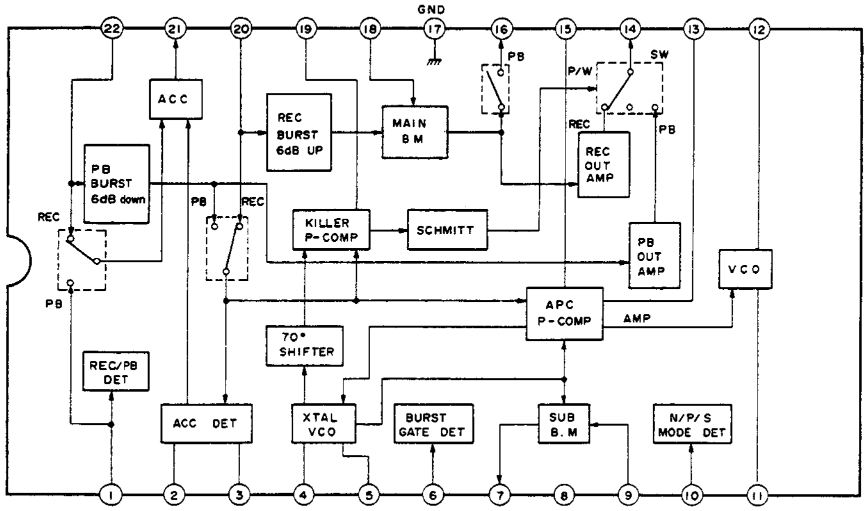
– AN6392 –

VTR REC Amplifier

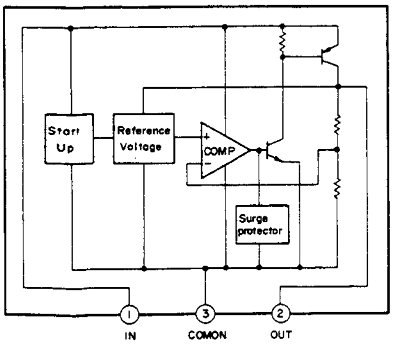

MUTE CTL
CURRENT SOURCE
+
–
1
2
3
4
5
6
7
8
9
GND
Vcc

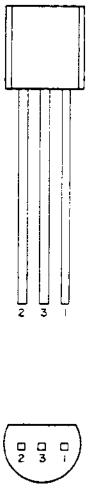
– AN6366N –

VTR Color Signal Processing Circuit


GND
22
21
20
19
18
17
16
15
14
13
12
PB
SW
P/W
ACC
REC BURST 6dB UP
MAIN BM
REC
PB
REC OUT AMP
PB BURST 6dB down
PB
REC
REC
KILLER P-COMP
SCHMITT
PB OUT AMP
VCO
PB
APC P-COMP
AMP
70° SHIFTER
REC/PB DET
ACC DET
XTAL VCO
BURST GATE DET
SUB B.M
N/P/S MODE DET
1
2
3
4
5
6
7
8
9
10
11

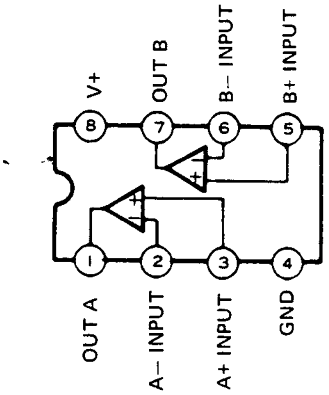
– AN8009 –


Start Up
Reference Voltage
COMP
+
–
Surge protector
1
3
2
IN
COMON
OUT

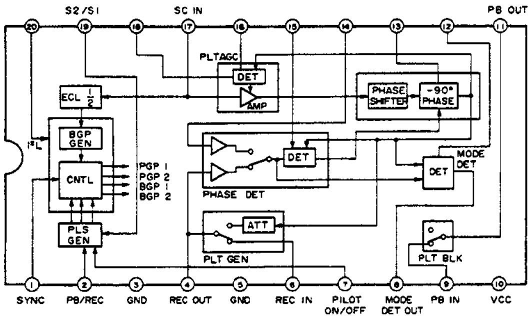


– BA6993F –

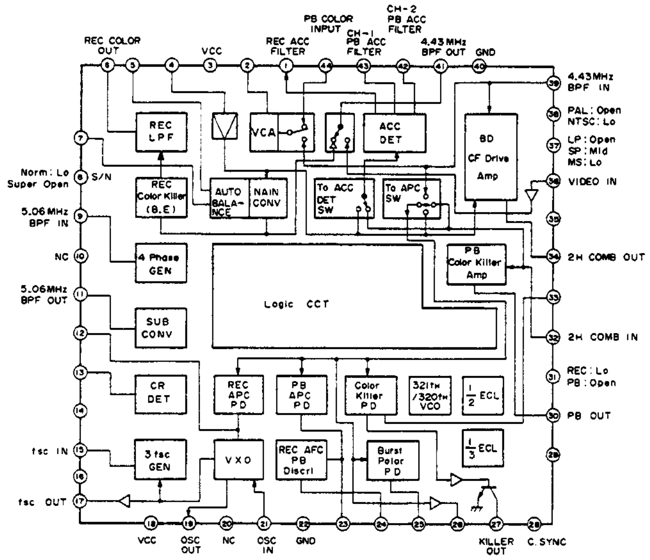
Dual Operational Amplifier


V+
OUT B
B– INPUT
B+ INPUT
8
7
6
5
+
–
+
–
1
2
3
4
OUT A
A– INPUT
A+ INPUT
GND

– HA118090MA –

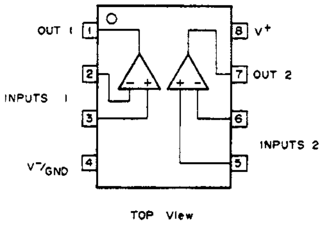

S2/S1
SC IN
PB OUT
PLTAGC
DET
AMP
ECL 1/2
PHASE SHIFTER
-90° PHASE
I²L
BGP GEN
CNTL
PGP 1
PGP 2
BGP 1
BGP 2
DET
PHASE DET
MODE DET
DET
ATT
PLT GEN
PLS GEN
PLT BLK
SYNC
PB/REC
GND
REC OUT
GND
REC IN
PILOT ON/OFF
MODE DET OUT
PB IN
VCC

– HA118092FP –

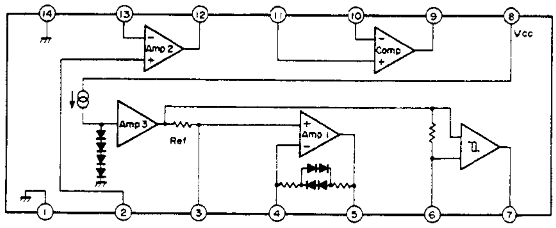

REC COLOR OUT
VCC
REC ACC FILTER
PB COLOR INPUT
CH-1 PB ACC FILTER
CH-2 PB ACC FILTER
4.43MHz BPF OUT
GND
4.43MHz BPF IN
PAL : Open
NTSC : Lo
LP : Open
SP : Mid
MS : Lo
VIDEO IN
2H COMB OUT
2H COMB IN
REC : Lo
PB : Open
PB OUT
Norm : Lo
Super Open
S/N
5.06MHz BPF IN
NC
5.06MHz BPF OUT
fsc IN
fsc OUT
REC LPF
VCA
ACC DET
BD
CF Drive
Amp
REC Color Killer (B.E)
AUTO BALANCE
NAIN CONV
To ACC DET SW
To APC SW
4 Phase GEN
SUB CONV
Logic CCT
PB Color Killer Amp
CR DET
REC APC PD
PB APC PD
Color Killer PD
321fH /320fH VCO
1/2 ECL
3 fsc GEN
VXO
REC AFC PB Discri
Burst Polor PD
1/3 ECL
VCC
OSC OUT
NC
OSC IN
GND
KILLER OUT
C.SYNC

– IR3F01N –

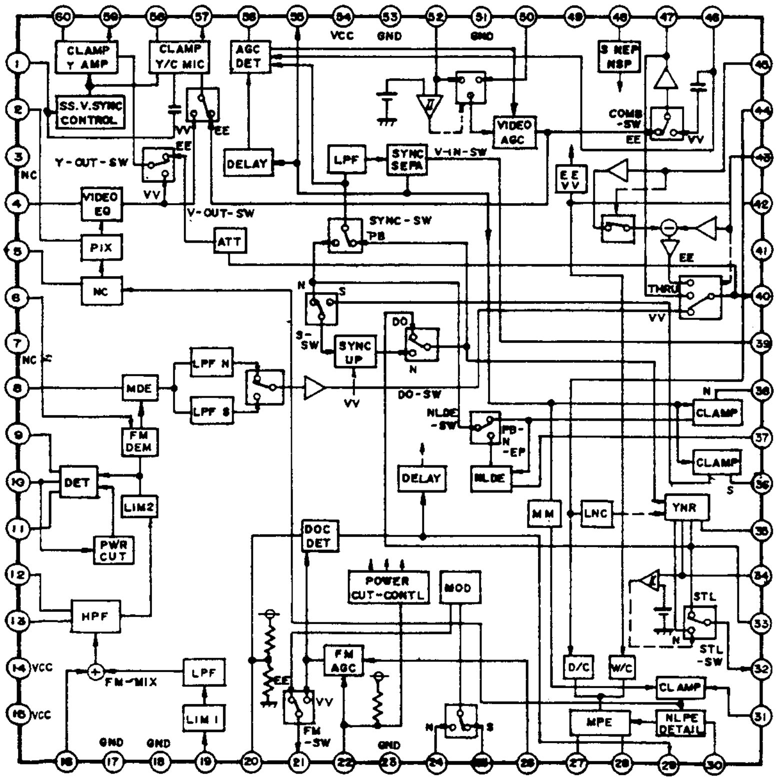
Dual Operational Amplifier


OUT 1
INPUTS 1
V⁻/GND
V⁺
OUT 2
INPUTS 2
TOP View

– M51798FP –

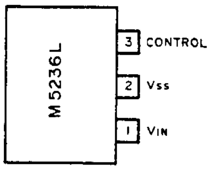

Amp 2
Comp
Vcc
Amp 3
Ref
Amp 1

– M52074FP –


VCC
GND
GND
CLAMP Y AMP
CLAMP Y/C MIC
AGC DET
S NEP NSP
SS.V.SYNC CONTROL
VV
EE
VIDEO AGC
COMB -SW
Y-OUT-SW
NC
DELAY
LPF
SYNC SEPA
V-IN-SW
EE VV
VIDEO EQ
V-OUT-SW
SYNC-SW
PB
PIX
ATT
NC
N
S
THRU
S-SW
SYNC UP
DO
DO-SW
MDE
LPF N
LPF S
FM DEM
NLDE -SW
PB-N-EP
CLAMP
DET
DELAY
NLDE
LIM2
MM
LNC
YNR
PWR CUT
DOC DET
POWER CUT-CONTL
MOD
STL
STL -SW
HPF
FM AGC
D/C
W/C
FM-MIX
LPF
FM -SW
CL AMP
LIM 1
MPE
NLPE DETAIL
VCC
VCC
GND
GND
GND

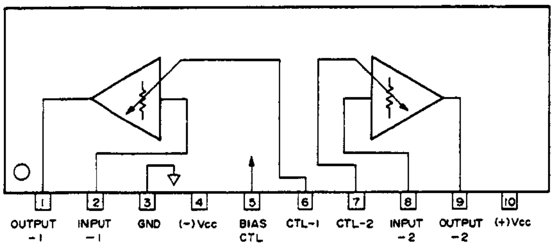
– M5236ML –

Regulator


M5236L
CONTROL
Vss
VIN

– M5241L –

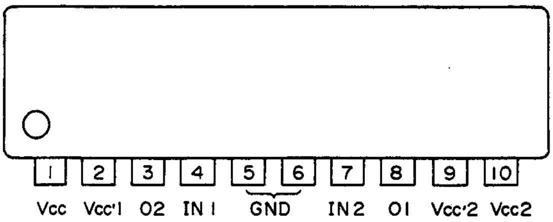
Voltage Controlled Amp



1 OUTPUT -1
2 INPUT -1
3 GND
4 (-)Vcc
5 BIAS CTL
6 CTL-1
7 CTL-2
8 INPUT -2
9 OUTPUT -2
10 (+)Vcc

– M54543ASL –

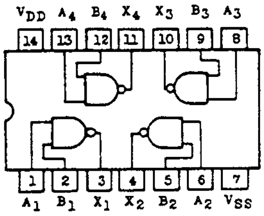
Bi-directional Motor Driver
With Thermal Shut down Function



1 Vcc
2 Vcc'1
3 O2
4 IN1
5 6 GND
7 IN2
8 O1
9 Vcc'2
10 Vcc2

– MN4011BS –

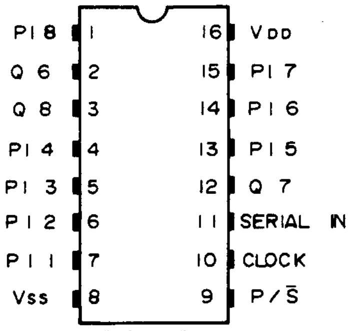
Quad 2 Input NAND Gate



V_{DD} 14
A_4 13
B_4 12
X_4 11
X_3 10
B_3 9
A_3 8
A_1 1
B_1 2
X_1 3
X_2 4
B_2 5
A_2 6
V_{SS} 7

– MN4021BS –

8-Stage Static Shift Register
(Asynchronous Parallel Input or Synchronous Serial Input/Serial Output)



PI 8 1
Q 6 2
Q 8 3
PI 4 4
PI 3 5
PI 2 6
PI 1 7
Vss 8
16 VDD
15 PI 7
14 PI 6
13 PI 5
12 Q 7
11 SERIAL IN
10 CLOCK
9 P/$\overline{S}$

(TOP VIEW)

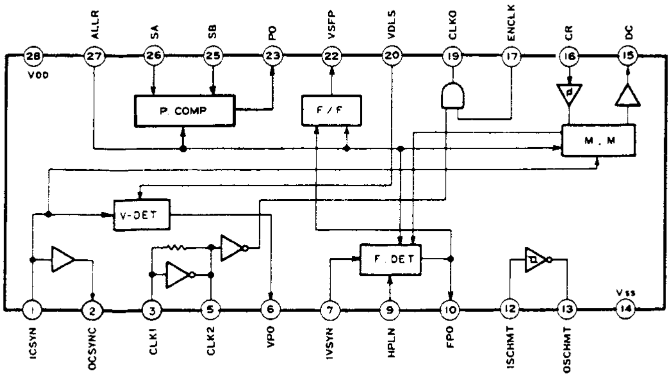
TRUTH TABLE

INPUTS					OUTPUTS △	
CLOCK △△	P/$\overline{S}$	PI_1	PI_n	SI	Q_1	Q_n
↑	L	※	※	L	L	$Q_n - 1$
↑	L	※	※	H	H	$Q_n - 1$
↓	L	※	※	※	No Change	
※	H	L	L	※	L	L
※	H	L	H	※	L	H
※	H	H	L	※	H	L
※	H	H	H	※	H	H

n ; 2 ~ 8
△ ; $Q_1 \sim Q_5$ Internal
△△ ; Level
※ ; Don't Care

– MN50005JVES –

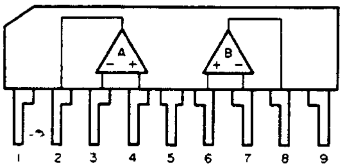
Frame/Field detector



28 VDD
27 ALLR
26 SA
25 SB
23 PO
22 VSFP
20 VDLS
19 CLKO
17 ENCLK
16 CR
15 DC
P. COMP
F / F
M . M
V-DET
F . DET
1 ICSYN
2 OCSYNC
3 CLK1
5 CLK2
6 VPO
7 IVSYN
9 HPLN
10 FPO
12 ISCHMT
13 OSCHMT
14 Vss

– NJM2068MD –
– NJM2068SD –
– NJM4556MB –
– NJM4556S –

Dual Operational Amplifier

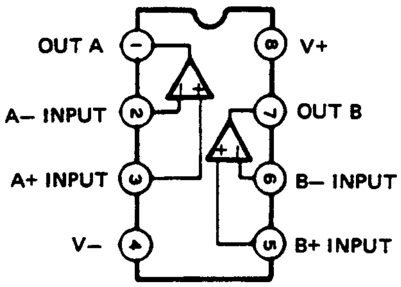


A
B
1 2 3 4 5 6 7 8 9

1. V^+
2. A OUTPUT
3. A-INPUT
4. A+INPUT
5. V^-
6. B+INPUT
7. B-INPUT
8. B OUTPUT
9. V^+

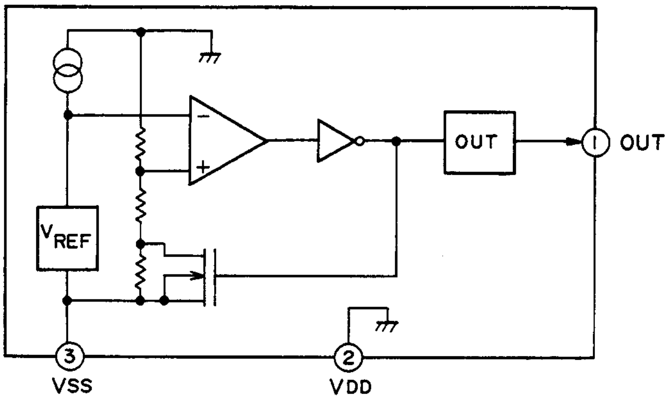
– NJM2904E –

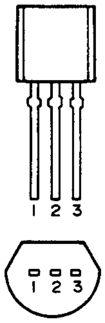
Dual Operational Amplifier


OUT A
A– INPUT
A+ INPUT
V–
V+
OUT B
B– INPUT
B+ INPUT
1
2
3
4
5
6
7
8

– S-8054HN-CB-X –

C-MOS Voltage detector

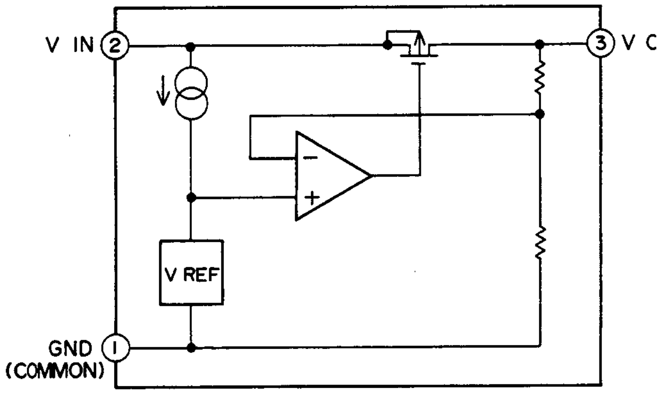

VREF
OUT
1 OUT
3
VSS
2
VDD

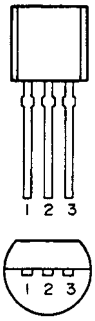


1 OUT
2 VDD
3 VSS

– S-81252HG –

C-MOS Voltage Regulator

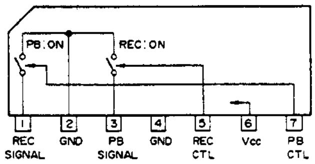

V IN 2
3 V C
V REF
GND 1
(COMMON)



1 GND
2 V IN
3 V OUT

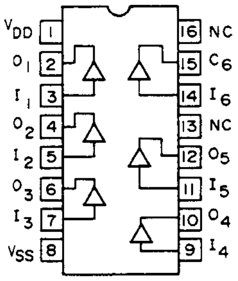
– TA7361AP –

Audio Head Switching


PB:ON
REC:ON
1
REC SIGNAL
2
GND
3
PB SIGNAL
4
GND
5
REC CTL
6
Vcc
7
PB CTL

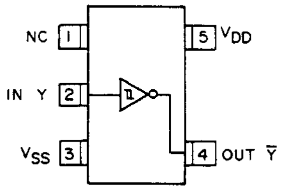
– TC4050BF –

Hex Buffer/Converter


VDD 1
O1 2
I1 3
O2 4
I2 5
O3 6
I3 7
VSS 8
16 NC
15 O6
14 I6
13 NC
12 O5
11 I5
10 O4
9 I4

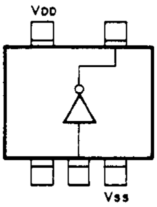
– TC4S584F –

Schmitt Trigger


NC 1
IN Y 2
VSS 3
5 VDD
4 OUT Ȳ

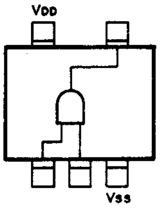
– TC4S69F –

INV



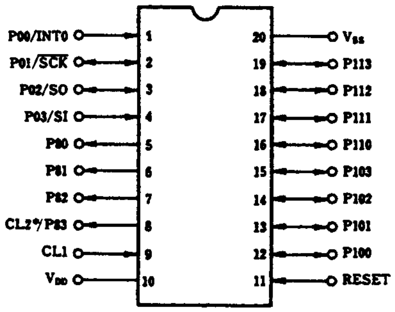
– TC4S81F –

AND



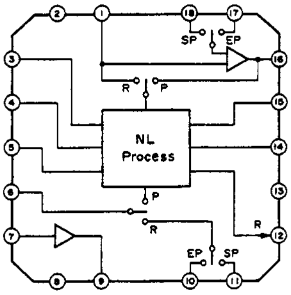
– UPD7564G-505 –

1chip-4bit Microcomputer



P00/INT0
P01/$\overline{\text{SCK}}$
P02/SO
P03/SI
P80
P81
P82
CL2*/P83
CL1
V_{DD}
1
2
3
4
5
6
7
8
9
10
20
19
18
17
16
15
14
13
12
11
V_{SS}
P113
P112
P111
P110
P103
P102
P101
P100
RESET

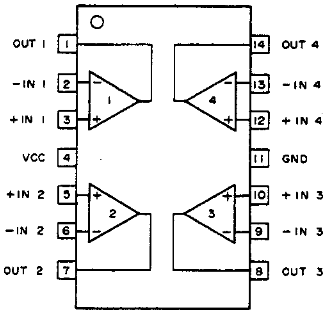
– VC2031MP –



2
1
18
17
SP
EP
3
16
R
P
4
15
NL
Process
5
14
6
P
13
R
R
7
12
EP
SP
8
9
10
11

– XRA10324F –

Dual Operational Amplifier



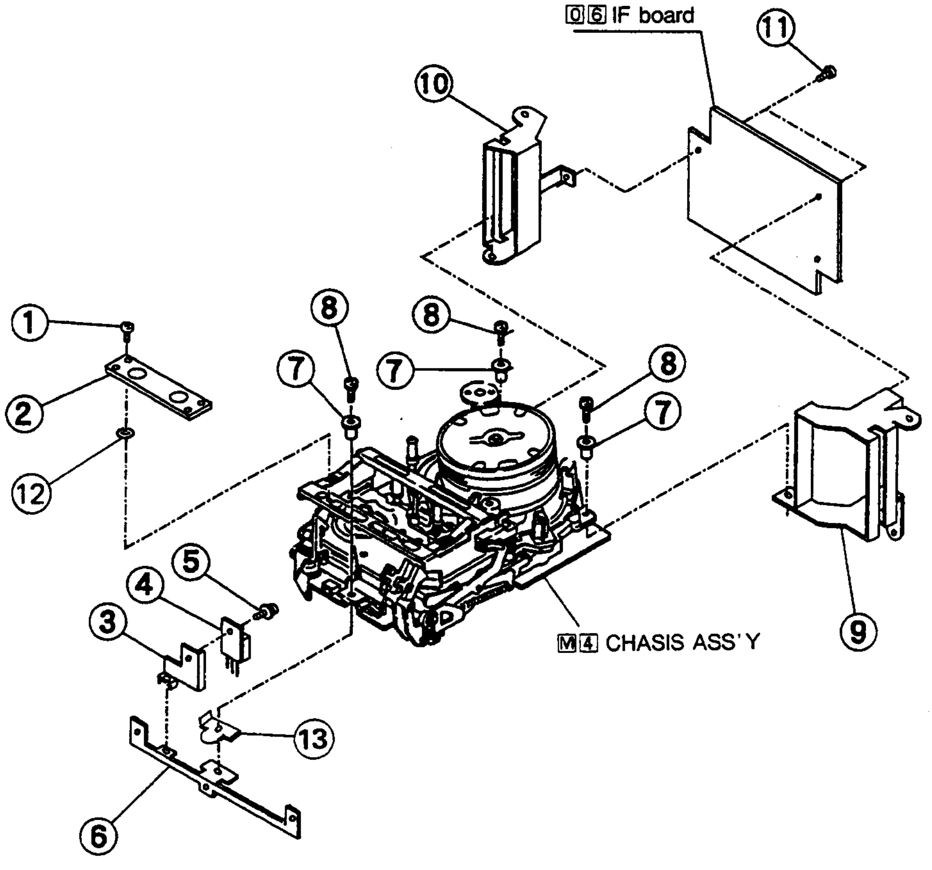
OUT 1
−IN 1
+IN 1
VCC
+IN 2
−IN 2
OUT 2
1
2
3
4
5
6
7
14
13
12
11
10
9
8
OUT 4
−IN 4
+IN 4
GND
+IN 3
−IN 3
OUT 3
1
2
3
4

SECTION 5
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

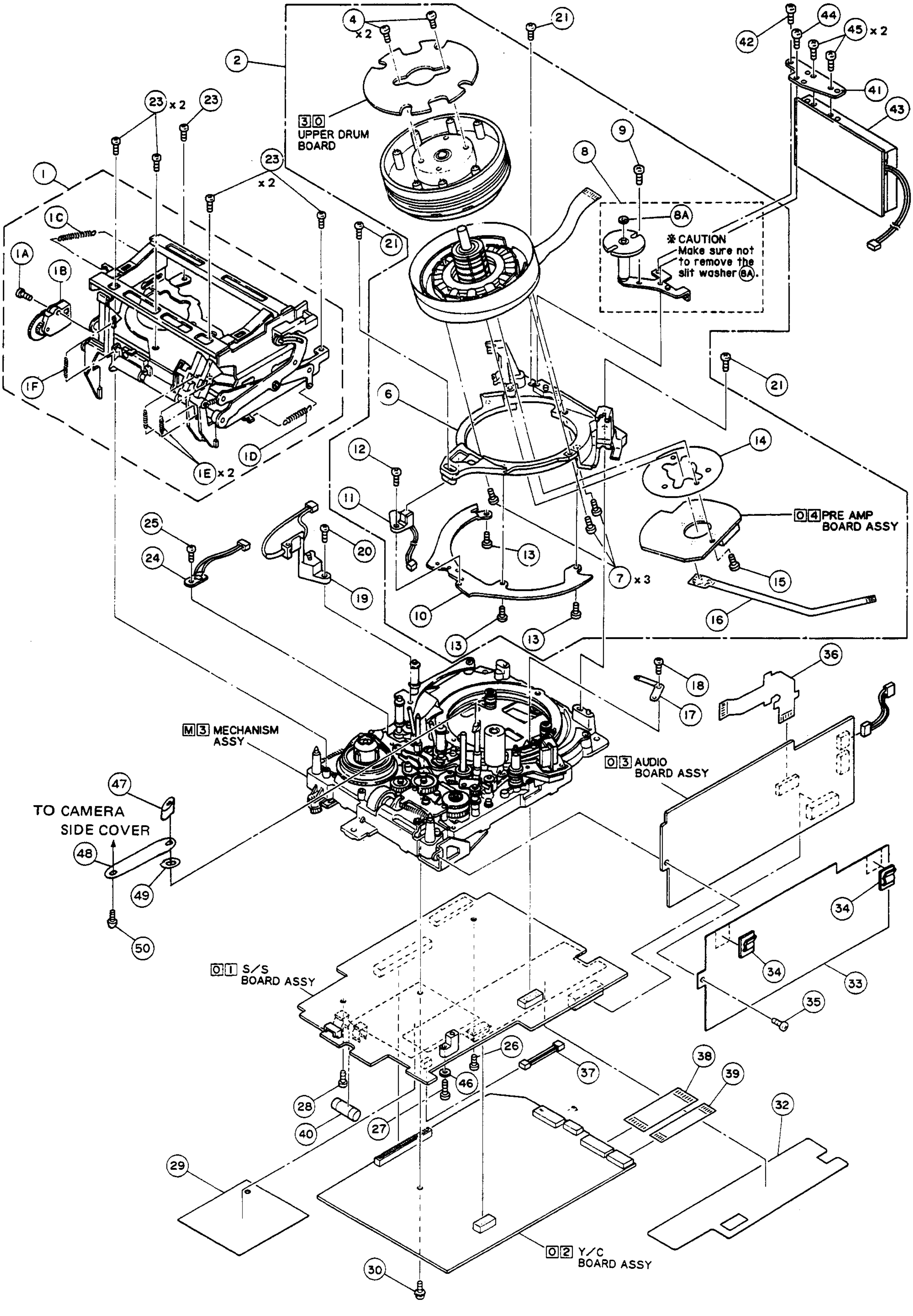
Parts identified by ⚠ symbol are critical for safety.
Replace only with specified part numbers.

5.1 VTR ASSEMBLY M3



# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	1	SPSK2040M	SCREW
	2	SC44681-001	VTR PLATE
	3	PRD43007	HEAT SINK
	4	2SB1019(Y)	TRANSISTOR, S/S BOARD - Q210
	5	SPSP3005ZY	SCREW
	6	PRD30546-01-04	BRACKET (1)
	7	PRD42941	SPACER
	8	SPSH2060Z	SCREW
	9	PRD30544-01-03	BRACKET (2)
	10	PRD30545-01-06	BRACKET (3)
	11	LPSP3006Z	SCREW
	12	Q03093-829	SPACER
	13	PRD43017-01-02	INSULATOR

5.2 CASSIS ASSEMBLY M4



4 ×2
21
42
44
45 ×2
2
41
43
23 ×2
23
30 UPPER DRUM BOARD
9
8
1
23 ×2
1C
8A
※CAUTION Make sure not to remove the slit washer 8A.
21
1A
1B
1F
6
21
14
12
1D
1E ×2
11
04 PRE AMP BOARD ASSY
25
20
13
24
7 ×3
15
19
10
16
13
13
36
18
17
M3 MECHANISM ASSY
03 AUDIO BOARD ASSY
47
TO CAMERA SIDE COVER
48
49
34
50
01 S/S BOARD ASSY
34
33
35
26
38
39
37
46
28
32
40
27
29
02 Y/C BOARD ASSY
30

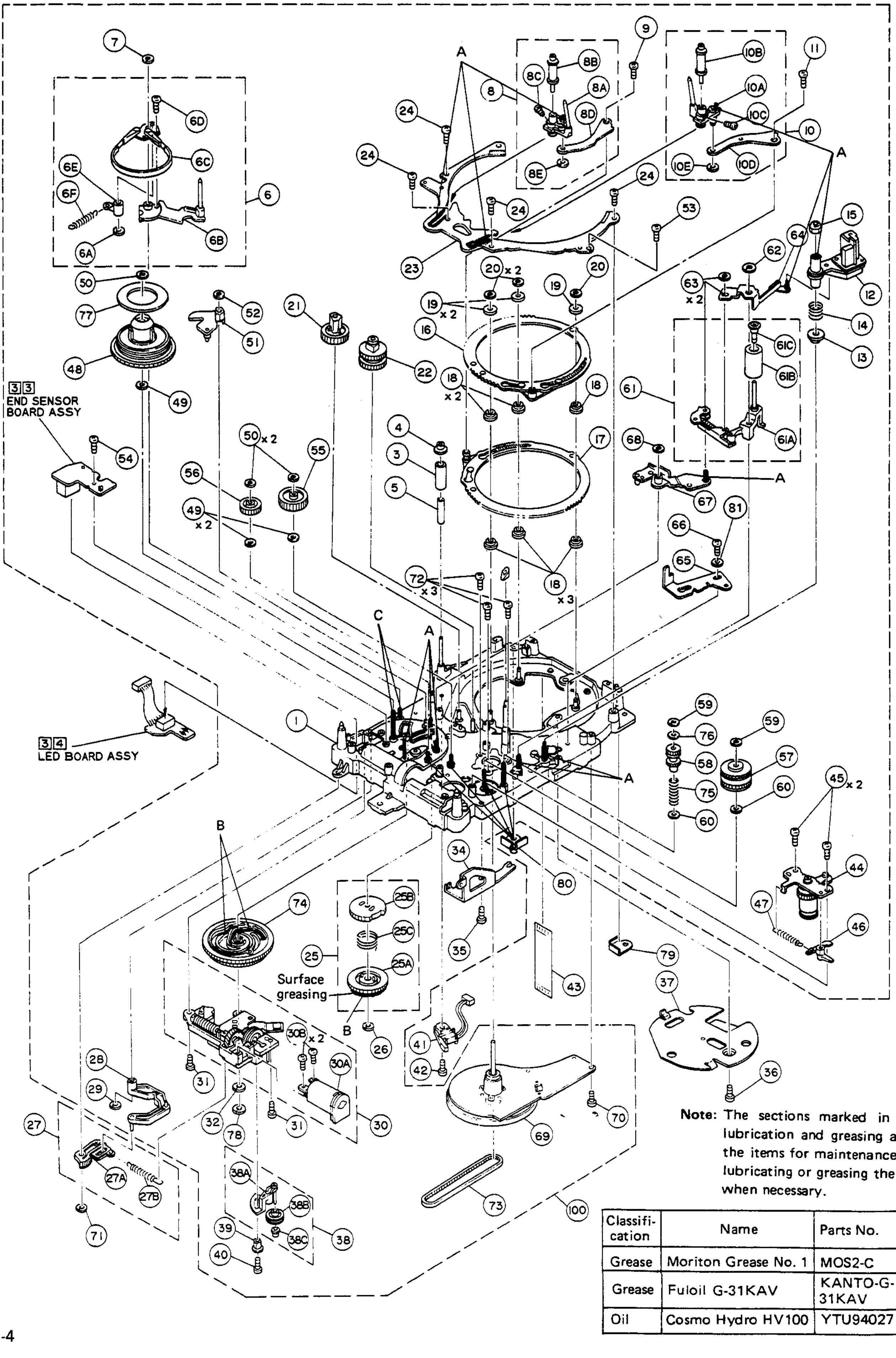
— Chassis assembly list —

****

CHASSIS ASSEMBLY <M3>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	1	PGS20694A	CASSETTE HOUSING ASSY
	1A	SPSH1760M	SCREW
	1B	YU40001	DAMPER
	1C	YQM30001-31	TENSION SPRING
	1D	YQM30001-33	TENSION SPRING
	1E	YQ41152-1-2	TENSION SPRING, X2
	1F	YQM30001-38-8	TENSION SPRING
⚠	2	PDV2242A	DRUM ASSY
	4	NDBP2606N	SCREW, X2
	6	YDM4037A-2	DRUM BASE SUB ASSY
	7	SPSP2006Z	SCREW, X3
	8	PGZ01438	IMPEDANCE ROLLER ASSY
	8A	PQM30017-27	SLIT WASHER
	9	SPSH1730M	MINI SCREW
	10	YDM3043-1-1	GUIDE RAIL 1
	11	YDM4052B-3	LED BRACKET ASSY
	12	SPSH1730M	MINI SCREW
	13	SPSH1730M	MINI SCREW, X3
	14	YDM4045A	SHIELD PLATE ASSY
	15	YDM4058	SPECIAL SCREW
	16	YDM2027	AUDIO BOARD FFC
	17	YU40993	BRUSH
	18	SPSH1720M	MINI SCREW
	19	YQ41393A-2	END SENSOR BRACKET ASSY
	20	SPSH1740M	MINI SCREW
	21	SPSP2608Z	SCREW, X3
	23	SPSK1730M	MINI SCREW, X5
	24	YU41071	DEW SENSOR
	25	SPSK1730M	MINI SCREW
	26	SPSH1730M	MINI SCREW
	27	SPSH1712R	MINI SCREW
	28	SPSN1740M	SCREW
	29	YU41233	SHIELD PLATE
	30	YQ40691	SPECIAL SCREW
	32	PRD43157	INSULATOR
	33	YU41278-1-1	SHIELD PLATE
	34	PGZ01086	FLAT CABLE CLIP, X2
	35	YQ40691	SPECIAL SCREW
	36	YU41260	A/C FLAT CABLE
	37	ML-Y00253B-1	LOADING MOTOR WIRE
	38	PGW0203-060140	FFC
	39	PGW0203-040070	FFC
⚠	40	QMF51E2-4R0	FUSE, (F001) T4.0A
	41	PRD30655	SHIELD BRACKET
	42	SPSH1735M	MINI SCREW
	43	PGZ01418-01-01	DC-DC CONVERTER
	44	SPSH1750M	SCREW
	45	SPSP2006Z	SCREW, X2
	46	Q03093-830	WASHER
	47	PRD42859	CAP
	48	SC44866-001	SHEET
	49	PRD42976	SPACER
	50	SPSK2030M	SCREW

5.3 MAIN ASSEMBLY (1) M5



7
6D
6C
6E
6F
6
6B
6A
50
77
48
49
52
51
21
22
3 3
END SENSOR
BOARD ASSY
54
50 x 2
55
56
49
x 2
4
3
5
A
8
8C
8B
8A
8D
8E
9
24
24
24
24
23
10B
10A
10C
10
10E
10D
11
A
53
15
64
62
63
x 2
12
14
13
20 x 2
20
19
19
x 2
16
18
x 2
18
61
61C
61B
61A
17
68
A
67
81
66
65
72
x 3
18
x 3
C
A
1
3 4
LED BOARD ASSY
59
76
58
75
60
59
57
60
45 x 2
A
B
74
34
80
44
47
46
25B
25C
25
25A
Surface
greasing
B
26
35
43
79
37
41
42
36
28
29
31
30B x 2
30A
27
32
78
31
30
69
70
27A
27B
38A
38B
38C
38
39
40
71
73
100

Note: The sections marked in red indicate lubrication and greasing areas. Follow the items for maintenance and checks, lubricating or greasing the red sections when necessary.

Classification	Name	Parts No.	Symbol in drawing
Grease	Moriton Grease No. 1	MOS2-C	A
Grease	Fuloil G-31KAV	KANTO-G-31KAV	B
Oil	Cosmo Hydro HV100	YTU94027	C

— Main-deck assembly list —

****

MAIN-DECK ASSEMBLY <M4>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	1	YQ20194A-8	MAIN DECK ASSY
	3	YQ41004	SUPPLY GUIDE ROLLER
	4	YQ41005	SUP FLANGE CAP
	5	YQ41378	COLLAR
	6	YQ41006C	TENSION ARM ASSY
	6A	PQM30017-27	SLIT WASHER
	6B	YQ41007A	TENSION POLE ASSY
	6C	YQ41010A-1	TENSION BAND ASSY
	6D	SPSJ1430M	MINI SCREW
	6E	YQ41014	SPRING HOOK
	6F	YQ41174-1-4	TENSION SPRING
	7	PQM30017-27	SLIT WASHER
	8	PRD43171A	POLE BASE ASSY, (SUPPLY)
	8A	PRD43172A	POLE BASE SUB ASSY, (SUPPLY)
	8B	PRD42999A	GUIDE ROLLER ASSY
	8C	SPSP1203Z	SET SCREW
	8D	YQ41027	LOADING ARM
	8E	PQM30017-25	SLIT WASHER
	9	PQ41450-2	SCREW
	10	YQ41028C	POLE BASE ASSY, (TAKE-UP)
	10A	YQ41029C	POLE BASE SUB ASSY, (TAKE-UP)
	10B	YQ41021A-2	GUIDE ROLLER ASSY
	10C	SPSP1203Z	SET SCREW
	10D	YQ41027	LOADING ARM
	10E	PQM30017-25	SLIT WASHER
	11	PQ41450-2	SCREW
	12	YQ41030B	A/C HEAD ARM ASSY
	13	YQ41035-1-1	SPRING PLATE
	14	YQM30002-14-4	COMPRESSION SPRING
	15	YQ41142A	NYLON NUT
	16	YQ41036A-3	LOADING RING ASSY, (SUPPLY)
	17	YQ41041A-4	LOADING RING ASSY, (TAKE-UP)
	18	YQ41045	COLLAR, X6
	19	YQ41046	FLANGE, X3
	20	PQM30017-25	SLIT WASHER, X3
	21	YQ41047-1-2	REEL IDRER GEAR 1
	22	YQ41048	REEL IDRER GEAR 2
	23	YQ20216-1-3	GUIDE RAIL 2
	24	SPSH1740M	MINI SCREW, X4
	25	YQ41168A-3	LOADING GEAR ASSY
	25A	YQ41049-1-1	LOADING GEAR 1
	25B	YQ41050-1-5	LOADING GEAR 2
	25C	YQ41051	TORSION SPRING
	26	PQM30017-25	SLIT WASHER
	27	YQ41211A-4	EJECT GEAR ASSY
	27A	YQ30399-1-5	EJECT GEAR
	27B	YQ41212-1-2	TENTION SPRING
	28	YQ41423A	EJECT LEVER ASSY
	29	PQM30017-27	SLIT WASHER
	30	YU41159-1-2	GEAR BOX FINAL ASSY
⚠	30A	YU40989V-1	LOADING MOTOR ASSY
	30B	SPSJ1440M	SCREW, X2
	31	SPSH1740M	MINI SCREW, X2
	32	PQM30017-25	SLIT WASHER
	34	YQ30424-1-2	AUDIO BOARD BRACKET
	35	SPSH1740M	MINI SCREW
	36	SPSH1720M	MINI SCREW
	37	YQ41126-1-2	SHIELD PLATE
	38	YQ41054A-4	IDRER PULLEY ASSY
	38A	YQ41055A	PULLEY HOLDER SUB ASSY
	38B	YQ41057	IDRER PULLEY
	38C	YQ41058	PULLEY CAP
	39	YQ41059-1-1	SCREW WASHER
	40	SPSJ1410M	SCREW
	41	YQ41184A	AL SWITCH ASSY
	42	SDSP2006Z	SCREW
	43	YU41180-2	PRE AMP FFC
	44	YU40991-1-1	CENTER PULLEY ASSY
	45	SPSH1740M	MINI SCREW, X2
	46	YQ30406	TAKE-UP BRAKE
	47	YQ41089	TENSION SPRING
	48	YU41588	SUPPLY REEL DISK ASSY
	49	Q03093-835	WASHER, X3
	50	PQM30017-27	SLIT WASHER, X3
	51	YQ41079A	CANCEL LEVER ASSY
	52	PQM30017-27	SLIT WASHER
	53	SPSH1740M	MINI SCREW
	54	SPSH1730M	MINI SCREW
	55	YQ41085	SUP GEAR
	56	YQ41086-2	MIDDLE GEAR
	57	YU40992-1-1	TAKE-UP CLUTCH ASSY
	58	YQ41342	TAKE-UP REEL GEAR
	59	PQM30017-27	SLIT WASHER,X2
	60	Q03093-835	WASHER, X2
	61	YQ41167B-8	PINCH ROLLER ARM FINAL ASSY
	61A	YQ41069B-7	PINCH ROLLER ARM ASSY
	61B	YQ40373B	PINCH ROLLER ASSY
	61C	YQ41766	PARA CAP
	62	PQM30017-23	SLIT WASHER
	63	PQM30017-27	SLIT WASHER, X2
	64	YQ41432A	HEAD ARM LEVER FINAL ASSY
	65	YQ41446	X PLATE
	66	YQ41425A-1	ALOCK SCREW
	67	YQ41060A-2	TENSION LEVER ASSY
	68	PQM30017-25	SLIT WASHER
⚠	69	YU40990V-2	CAPSTAN MOTOR
	70	SPSH1730M	MINI SCREW
	71	PQM30017-25	SLIT WASHER
	72	SPSK1740M	MINI SCREW, X3
	73	YQ41084	TIMING BELT
	74	YQ20195-1-6	CONTROL CAM
	75	YQM30002-17	COMPRESSION SPRING
	76	YQM30050-3	SPACER
	77	PRD42951-02-01	REEL DISK RUBBER
	78	Q03093-830	WASHER
	79	PRD43154-01-01	INSULATOR(D)
	80	PRD43155-01-01	INSULATOR(E)
	81	WSE1700	WASHER
	100	PGS20674B-01	MECHA ASSY

SECTION 6
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS— All resistance values are in ohms (Ω), unless otherwise indicated.

k : 1,000 (Kilo)
M : 1,000,000 (Mega)
Chip R : Chip Resistor
Chip VR : Chip Variable Resistor
Comp. R : Composition Resistor
CR : Carbon Film Resistor
FR : Fusible Resistor
MFR : Metal Film Resistor
MPR : Metal Plate Resistor
OMR : Oxide Metal Film Resistor
PMR : Precision Metal Film Resistor
UFR : Unflammable Resistor
VR : Variable Resistor (Potentiometer)
WR : Wire Wound Resistor

CAPACITORS—All capacitance values are in μF, unless otherwise indicated.

pF : μμF (Pico farad)
C Cap : Caramic Capacitor
Chip Cap : Chip Capacitor
Chip T Cap : Chip Tantalum Capacitor
E Cap : Electrolytic Capacitor
FM Cap : Film Mica Capacitor
LL Cap : Low Leak Current Electrolytic Capacitor
MM Cap : Metalized Mylar Capacitor
MP Cap : Metalized Paper Capacitor
MY Cap : Mylar Capacitor
NP Cap : Non-polar Capacitor
PC Cap : Polycarbonate Capacitor
PP Cap : Polypropylene Capacitor
PS Cap : Polystyrol Capacitor
T Cap : Tantalum Capacitor
TF Cap : Thin Film Capacitor
TR Cap : Trimmer Capacitor

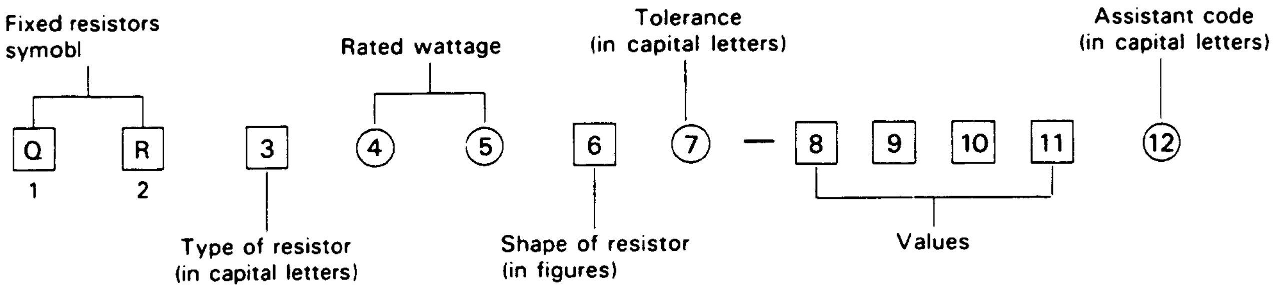
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X " indicates quantity per set.

6.1 STANDARD PART NUMBER CODING

6.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.


Fixed resistors symobl
Rated wattage
Tolerance (in capital letters)
Assistant code (in capital letters)
Q
R
1
2
3
4
5
6
7
8
9
10
11
12
Type of resistor (in capital letters)
Shape of resistor (in figures)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon film resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors

Rated wattage (fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance (seventh digit)

F	± 1 %
G	± 2 %
J	± 5 %
K	± 10 %
M	± 20 %

Assistant code (twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead taping
Z	Lead taping

Values (eighth – tenth or eleventh digits)

examples:

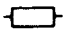
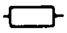
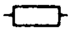
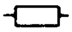
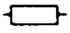
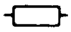
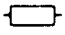
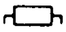
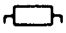
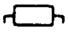
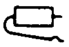
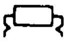
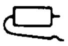
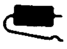
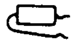
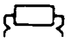
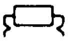
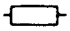
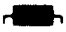
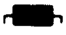
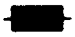
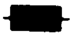
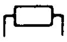
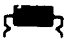
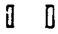
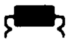
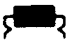
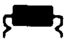
R47		0.47 Ω
4R7		4.7 Ω
470	47×10^0	47 Ω
471	47×10^1	470 Ω
472	47×10^2	4.7 kΩ
473	47×10^3	47 kΩ
474	47×10^4	470 kΩ
475	47×10^5	4.7 MΩ

QRV resistance shown by four digits:

4640	464×10^0	464 Ω
4641	464×10^1	4.64 kΩ
4642	464×10^2	46.4 kΩ

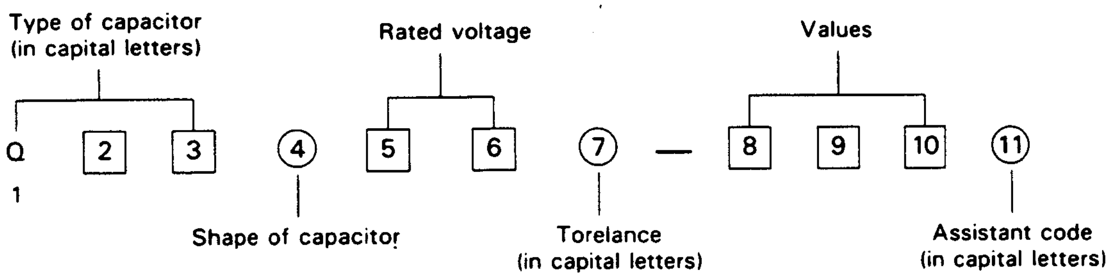
Shape of resistor (sixth digit)

Note: ■ indicates flame retardant resistor.

Type of resistor / Shape of resistor	C'	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

6.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.


Type of capacitor
(in capital letters)
Rated voltage
Values
Q
1
2
3
4
5
6
7
—
8
9
10
11
Shape of capacitor
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first — third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	±5 %	X	$^{+40}_{-20}$ %
K	±10 %	Z	$^{+80}_{-20}$ %

Values (eighth — tenth digits)

Example : Values are in picofarads

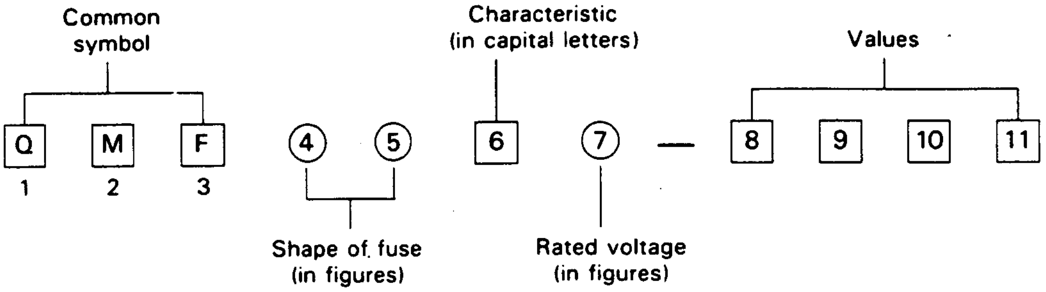
101 .... 10×10^{1} pF .... 100 pF
102 .... 10×10^{2} pF .... 1,000 pF (0.001 μF)
103 .... 10×10^{3} pF .... 10,000 pF (0.01 μF)
104 .... 10×10^{4} pF .... 100,000 pF (0.1 μF)
105 .... 10×10^{5} pF .... 1 μF
5R0 .... 5.0 pF

Assistant code (eleventh digit)

G Small size
Z Lead taping
Y Lead taping

6.1.3 Fuse coding

Standard fuse part numbers are as follows.


Common symbol
Characteristic (in capital letters)
Values
Q
M
F
1
2
3
④
⑤
6
⑦
—
8
9
10
11
Shape of fuse (in figures)
Rated voltage (in figures)

Shape of fuse
(fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage
(seventh digit)

1	AC125 V
2	AC250 V
3	0.1 – 1 A : AC250 V 1.25 – 6.3 A : AC125 V

Values
(eighth-tenth or eleventh digits)
example:

R63	.... 0.63 A
1R0	.... 1.0 A
2R5	.... 2.5 A
100	.... 10 A
R315	.... 0.315 A
1R25	.... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

6.2 ELECTRICAL PARTS LIST BY ASSEMBLY

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S/S BOARD ASSEMBLY <01>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	PRK20078B-02	S/S BOARD ASSY	
IC1	M37405E5-204FP	IC	
IC2	TC4S584F	IC	
IC5	M54543ASL	IC	
IC6	TC4S69F	IC	
IC7	TC4S69F	IC	
IC8	XRA10324F	IC	
IC9	XRA10324F	IC	
IC10	AFZ72F25A5	TRAP	
IC11	MN50005JVES	IC	
IC12	MN4011BS	IC	
IC201	S-81252HG	IC	
IC202	M5236ML	IC	
IC301	VC5026G	IC	
IC401	VC5035	IC	
IC402	BA10339F	IC	
IC501	M51798FP	IC	
IC502	IR3F01N	IC	
IC701	NJM2904E	IC	
	or LM2904E	IC	
IC801	S-8054HN-CB-X	IC	
IC802	S-8054HN-CB-X	IC	
Q1	DTA144EK	TRANSISTOR	
Q2	DTC144EK	TRANSISTOR	
Q4	2SA1037K(QR)	TRANSISTOR	
Q5	DTA124EK	TRANSISTOR	
Q6	2SC2412K(QR)	TRANSISTOR	
Q8	DTA124EK	TRANSISTOR	
Q9	DTC124EK	TRANSISTOR	
Q10	DTC124EK	TRANSISTOR	
Q11	DTC124EK	TRANSISTOR	
Q12	DTC124EK	TRANSISTOR	
Q14	DTA124EK	TRANSISTOR	
Q15	DTC124EK	TRANSISTOR	
Q16	DTC144EK	TRANSISTOR	
Q17	DTC124EK	TRANSISTOR	
Q18	DTC124EK	TRANSISTOR	
Q19	DTC124EK	TRANSISTOR	
Q20	DTA124EK	TRANSISTOR	
Q21	DTC124EK	TRANSISTOR	
Q201	DTA143ZK	TRANSISTOR	
Q202	2SB1132(QR)	TRANSISTOR	
Q203	2SB1019(Y)	TRANSISTOR	
Q204	2SJ146	FE TRANSISTOR	
Q301	2SB798	TRANSISTOR	
Q302	2SB798	TRANSISTOR	
Q303	2SB798	TRANSISTOR	
D2	DAP202K	DIODE	
D3	DAP202K	DIODE	
D5	DAP202K	DIODE	
D6	DAN202K	CHIP DIODE ARRAY	
D201	ERA81-004	DIODE	
D202	1SS133	DIODE	
D203	FMN1	DIODE	
D204	RD20EB2	ZENER DIODE	
D205	RD3.3EB2	ZENER DIODE	
D401	DAN202K	CHIP DIODE ARRAY	
D501	DA204K	DIODE	
D503	DAN202K	CHIP DIODE ARRAY	
D504	DAN202K	CHIP DIODE ARRAY	
D505	DAN202K	CHIP DIODE ARRAY	
D506	DAN202K	CHIP DIODE ARRAY	
D801	DAN202K	CHIP DIO.ARRAY	
DS1	YU41318-2	REEL SENSOR BRACKET	
R1	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R2	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R3	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R4	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R5	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R6	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R7	NVP1301-473N	V RESISTOR, SW POINT	47KΩ
R8	QRSA08J-273YN	RESISTOR	27KΩ,1/10W
R9	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R10	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R11	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R12	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R13	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R14	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W
R16	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R17	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R19	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R20	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R22	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R23	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R24	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R25	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R26	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R27	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R28	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
R29	QRSA08J-102YN	RESISTOR	1KΩ,1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R30	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R31	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R32	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R33	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R34	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R35	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R36	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
R37	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
R38	QRSA08J-561YN	RESISTOR	560Ω,1/10W
R39	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R40	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R41	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R42	QRSA08J-100YN	RESISTOR	10Ω,1/10W
R44	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R45	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R46	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R47	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R48	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R49	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R50	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R51	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R53	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R54	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R55	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R56	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R57	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R58	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R59	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R60	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R61	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R63	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R64	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R65	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R66	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R67	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R68	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R69	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R70	QRSA08J-681YN	RESISTOR	680Ω,1/10W
R71	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R72	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R73	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R75	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R76	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R77	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R78	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
R79	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R80	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R81	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R82	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R83	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R84	QRSA08J-683YN	RESISTOR	68KΩ,1/10W
R85	QRSA08J-184YN	RESISTOR	180KΩ,1/10W
R86	QRSA08J-563YN	RESISTOR	56KΩ,1/10W
R87	QRSA08J-154YN	RESISTOR	150KΩ,1/10W
R88	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R89	QRSA08J-274YN	RESISTOR	270KΩ,1/10W
R90	QRSA08J-393YN	RESISTOR	39KΩ,1/10W
R91	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
R92	QRSA08J-332YN	RESISTOR	3.3KΩ,1/10W
R93	QRSA08J-684YN	RESISTOR	680KΩ,1/10W
R94	QRSA08J-393YN	RESISTOR	39KΩ,1/10W
R95	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R97	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R98	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R99	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R100	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
R101	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R102	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R103	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
R104	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R105	QRSA08J-561YN	RESISTOR	560Ω,1/10W
R106	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R107	QRSA08J-182YN	RESISTOR	1.8KΩ,1/10W
R108	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R109	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R110	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R111	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R112	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R113	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R114	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R115	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R116	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R117	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R118	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R120	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R125	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R131	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R138	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R139	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R140	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R141	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R142	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W
R143	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
R144	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
R145	QRSA08J-393YN	RESISTOR	39KΩ,1/10W
R147	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W
R149	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R150	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R202	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R203	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R204	NRVA62D-223N	RESISTOR	22KΩ,1/16W
R205	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R206	NRVA62D-133N	RESISTOR	13KΩ,1/16W
R207	QRSA08J-221YN	RESISTOR	220Ω,1/10W
R208	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R209	QRSA08J-822YN	RESISTOR	8.2KΩ,1/10W
R211	QRSA08J-123YN	RESISTOR	12KΩ,1/10W
R212	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R213	QRSA08J-824YN	RESISTOR	820KΩ,1/10W
R215	NVP1301-102N	V RESISTOR, VERTICAL JITTER	1KΩ

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#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R226	NVP1301-102N	V RESISTOR, REG 8V	1KΩ
⚠ R301	QRSA08J-560YN	RESISTOR	56Ω,1/10W
⚠ R302	QRSA08J-560YN	RESISTOR	56Ω,1/10W
R304	QRSA08J-2R2YN	RESISTOR	2.2Ω,1/10W
R305	QRSA08J-2R2YN	RESISTOR	2.2Ω,1/10W
R306	QRSA08J-2R2YN	RESISTOR	2.2Ω,1/10W
R307	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R308	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R309	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R310	QRSA08J-183YN	RESISTOR	18KΩ,1/10W
R311	QRSA08J-683YN	RESISTOR	68KΩ,1/10W
R401	QRSA08J-2R2YN	RESISTOR	2.2Ω,1/10W
R402	QRSA08J-2R2YN	RESISTOR	2.2Ω,1/10W
R403	QRSA08J-2R2YN	RESISTOR	2.2Ω,1/10W
R404	QRSA08J-273YN	RESISTOR	27KΩ,1/10W
R405	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R406	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
R407	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R408	QRSA08J-154YN	RESISTOR	150KΩ,1/10W
R409	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R410	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R411	QRG12BJ-R68AR	MF RESISTOR	0.68Ω,1/2W
R412	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R413	QRSA08J-431YN	RESISTOR	430Ω,1/10W
R414	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R415	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R416	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R417	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R418	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R419	QRSA08J-202YN	RESISTOR	2KΩ,1/10W
R420	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R421	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R422	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R423	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R424	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
R425	QRSA08J-912YN	RESISTOR	9.1KΩ,1/10W
R501	QRSA08J-221YN	RESISTOR	220Ω,1/10W
R503	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R504	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R505	QRSA08J-474YN	RESISTOR	470KΩ,1/10W
R506	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R507	QRSA08J-474YN	RESISTOR	470KΩ,1/10W
R508	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R509	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R510	QRSA08J-473YN	RESISTOR	47KΩ,1/10W
R511	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R513	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R514	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
R515	QRSA08J-392YN	RESISTOR	3.9KΩ,1/10W
R516	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R517	QRSA08J-683YN	RESISTOR	68KΩ,1/10W
R518	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R519	QRSA08J-392YN	RESISTOR	3.9KΩ,1/10W
R520	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R521	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R522	QRSA08J-683YN	RESISTOR	68KΩ,1/10W
R523	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
R524	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R526	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R701	NRVA62D-104N	RESISTOR	100KΩ,1/16W
R702	NRVA62D-752N	RESISTOR	7.5KΩ,1/16W
R703	NRVA62D-752N	RESISTOR	7.5KΩ,1/16W
R704	NRVA62D-104N	RESISTOR	100KΩ,1/16W
R705	NRVA62D-513N	RESISTOR	51KΩ,1/16W
R706	NRVA62D-272N	RESISTOR	2.7KΩ,1/16W
R707	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R708	QRSA08J-683YN	RESISTOR	68KΩ,1/10W
R801	QRSA08J-223YN	RESISTOR	22KΩ,1/10W
R803	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
R804	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
C1	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C3	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C4	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C5	QCY81EK-683	CAPACITOR	0.068µF,25V
C6	QCY81EK-683	CAPACITOR	0.068µF,25V
C7	QCSA1HJ-100	CHIP.C CAPACITOR	10PF,50V
C8	QCSA1HJ-100	CHIP.C CAPACITOR	10PF,50V
C11	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C12	QERF0JM-107	E CAPACITOR	100µF,6.3V
C13	QFZ0095-473	M CAPACITOR	0.047µF
C14	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C15	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C16	QERF1HM-335	E CAPACITOR	3.3µF,50V
C17	QCYA1HK-103	CHIP.C CAPACITOR	0.01µF,50V
C18	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
C19	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
C20	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
C21	QENF1CM-475	E CAPACITOR	4.7µF,16V
C22	QENF1VM-225	E CAPACITOR	2.2µF,35V
C23	QCYA1HK-153	CHIP.C CAPACITOR	0.015µF,50V
C24	QENF1CM-475	E CAPACITOR	4.7µF,16V
C25	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
C26	QENF1HM-474	NP E CAPACITOR	0.47µF,50V
C27	QCYA1HK-333	CHIP.C CAPACITOR	0.033µF,50V
C28	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
C29	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
C30	QCSA1HJ-561	CHIP.C CAPACITOR	560PF,50V
C31	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
C32	QCSA1HJ-330	CHIP.C CAPACITOR	33PF,50V
C33	QCSA1HJ-330	CHIP.C CAPACITOR	33PF,50V
C34	QCYA1HK-103	CHIP.C CAPACITOR	0.01µF,50V
C35	QCYA1HK-473	CHIP.C CAPACITOR	0.047µF,50V
C36	QCFA1EZ-104	CHIP.C CAP	0.1µF,25V
C201	QERF1CM-476	E CAPACITOR	47µF,16V
C202	QERF0JM-107	E CAPACITOR	100µF,6.3V
C203	QCFA1HZ-473	CHIP.C CAPACITOR	0.047µF,50V
C204	QEDF1AM-826	E CAPACITOR	82µF,10V
C205	QERF1HM-104	E CAPACITOR	0.1µF,50V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C206	QEA40HZ-224	E CAPACITOR (DOUBLE)	0.22F,5.5V
	C207	QEM71CM-687	E CAPACITOR	680µF,16V
	C301	QCYA1HK-223	CHIP.C CAPACITOR	0.022µF,50V
	C302	QCYA1HK-223	CHIP.C CAPACITOR	0.022µF,50V
	C303	QCYA1HK-223	CHIP.C CAPACITOR	0.022µF,50V
	C304	QERF1AM-336	E CAPACITOR	33µF,10V
	C305	QERF1AM-336	E CAPACITOR	33µF,10V
	C306	QERF1AM-336	E CAPACITOR	33µF,10V
	C307	QCYA1HK-103	CHIP.C CAPACITOR	0.01µF,50V
	C308	QCYA1HK-103	CHIP.C CAPACITOR	0.01µF,50V
	C401	QERF1CM-106	E CAPACITOR	10µF,16V
	C402	QER41CM-106	E CAPACITOR	10µF,16V
	C403	QERF1CM-106	E CAPACITOR	10µF,16V
	C404	QCFA1HZ-104	CHIP.C CAPACITOR	0.1µF,50V
	C405	QCYA1HK-103	CHIP.C CAPACITOR	0.01µF,50V
	C406	QCYA1HK-471	CAPACITOR	470PF,50V
	C407	QFJ41HJ-473	M CAPACITOR	0.047µF,50V
	C408	QCFA1HZ-104	CHIP.C CAPACITOR	0.1µF,50V
	C409	QERF1CM-106	E CAPACITOR	10µF,16V
	C410	QCFA1HZ-473	CHIP.C CAPACITOR	0.047µF,50V
	C411	QCYA1HK-222	CHIP.C CAPACITOR	0.0022µF,50V
	C412	QCSA1HJ-471	CHIP.C CAPACITOR	470PF,50V
	C413	QCYA1HK-332	CHIP.C CAPACITOR	0.0033µF,50V
	C414	QCYA1HK-222	CHIP.C CAPACITOR	0.0022µF,50V
	C415	QCFA1HZ-104	CHIP.C CAPACITOR	0.1µF,50V
	C416	QERF1CM-106	E CAPACITOR	10µF,16V
	C501	QERF0JM-107	E CAPACITOR	100µF,6.3V
	C502	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
	C503	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
	C504	QERF1CM-476	E CAPACITOR	47µF,16V
	C505	QERF1HM-105	E CAPACITOR	1µF,50V
	C506	QCSA1HJ-471	CHIP.C CAPACITOR	470PF,50V
	C507	QCFA1EZ-104	CHIP.C CAPACITOR	0.1µF,25V
	C508	QCSA1HJ-100	CHIP.C CAPACITOR	10PF,50V
	C509	QCYA1HK-103	CHIP.C CAPACITOR	0.01µF,50V
	C510	QERF1CM-106	E CAPACITOR	10µF,16V
	C511	QCF81CZ-105	CAPACITOR	1µF,16V
	C512	QCYA1HK-223	CHIP.C CAPACITOR	0.022µF,50V
	C513	QCYA1HK-223	CHIP.C CAPACITOR	0.022µF,50V
	C514	QER41CM-106	E CAPACITOR	10µF,16V
	C515	QER41CM-106	E CAPACITOR	10µF,16V
	C516	QER41CM-106	E CAPACITOR	10µF,16V
	C517	QERF1CM-106	E CAPACITOR	10µF,16V
	C518	QCYA1HK-102	CHIP.C CAPACITOR	0.001µF,50V
	C701	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C702	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C703	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C704	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C705	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C706	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C707	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C708	QCTA2CH-102	CHIP.C CAPACITOR	0.001µF,160V
	C801	QEF81AM-105	TANTAL CAPACITOR	1µF,10V
	C802	QEF81AM-105	TANTAL CAPACITOR	1µF,10V
	C803	QEF81AM-105	TANTAL CAPACITOR	1µF,10V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	CF1	PU55407	RESONATOR
⚠	X1	YU40962	CRYSTAL RESONATOR
	SW1	YU40177-2	PUSH SWITCH
	SW2	YU40177-2	PUSH SWITCH
	SW3	YU40177-2	PUSH SWITCH
	SW4	YU41145-1-1	REAF SWITCH
	CL1	PU56729-2	WIRE CLAMP
	WR1	PGW0203-100160	FFC
	WR2	PGW0203-080160	FFC
	J30	QWE251-08A2A2	WIRE
	J31	QWE250-12A2A2	WIRE
	TP203	PGZ01015	CHIP TEST-PIN
	TP204	PGZ01015	CHIP TEST-PIN
	TP401	PGZ01015	CHIP TEST-PIN
	TP501	PGZ01015	CHIP TEST-PIN
	CN1	YU40108-16	CONNECTOR
	CN2	YU40677-30	CONNECTOR
	CN3	YU40106-15	CONNECTOR
	CN4	YU40101-26	CONNECTOR
	CN5	YU40105-16	CAP HOUSING,(BOARD TO BOARD)
	CN6	YU40960-16	CONNECTOR
	CN7	PGZ00651-004	CONNECTOR
	CN8	YU40096-7	CONNECTOR
	CN9	YU40096-2B	CONNECTOR
	CN10	YU40096-2Y	CONNECTOR
	CN11	YU40096-2	CONNECTOR
	CN12	YU40096-2	CONNECTOR
	CN13	YU40096-3	CONNECTOR
	CN14	YU40096-12	CONNECTOR
	CN15	YU40593-14	CONNECTOR
	CN16	YU40108-16	CONNECTOR
	CN17	PGZ00651-003	CONNECTOR, (FOR Q203)
⚠	CP201	ICP-F38	CIRCUIT PROTECTOR
⚠	CP202	ICP-F38	CIRCUIT PROTECTOR
⚠	CP203	ICP-F38	CIRCUIT PROTECTOR
⚠	CP204	ICP-F38	CIRCUIT PROTECTOR

– DET BOARD ASSEMBLY –

PWBA1	PRK20097A	DET BOARD ASSY
IC901	S-8054HN	IC
Q901	2SC2412K(QR)	TRANSISTOR
R901	QRSA08J-224YN	RESISTOR
R902	QRSA08J-105YN	RESISTOR

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Y/C BOARD ASSEMBLY <02>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWBA	PRK10048A-02	Y/C BOARD ASSY
IC5	BX7769WA	IC
IC11	CXL5003M	IC
IC14	AN8009	IC
IC15	TA8733F	IC
IC16	M52074FP	IC
IC17	AN6392	IC
IC18	VC2031MP	IC
IC20	AN6308S	IC
IC401	HA118090MA	IC
IC403	HA118092FP	IC
IC500	TC74HC4538AF	IC
IC501	AN6366N	IC
IC502	AN6308S	IC
Q43	2SC4081(QRS)	TRANSISTOR
Q44	2SC4081(QRS)	TRANSISTOR
Q45	2SC4081(QRS)	TRANSISTOR
Q46	2SA1576(QRS)	TRANSISTOR
Q47	2SC4081(QRS)	TRANSISTOR
Q57	2SA1036K	TRANSISTOR
Q63	2SA1036K	TRANSISTOR
Q65	2SC4081(QRS)	TRANSISTOR
Q66	2SC4081(QRS)	TRANSISTOR
Q69	DTC144EU	TRANSISTOR
Q70	2SA1036K	TRANSISTOR
Q71	2SA1576(QRS)	TRANSISTOR
Q72	DTC144EU	TRANSISTOR
Q74	2SA1576(QRS)	TRANSISTOR
Q75	DTC144EU	TRANSISTOR
Q76	DTC124EU	TRANSISTOR
Q77	2SC4098(PQ)	TRANSISTOR
Q78	DTC144EU	TRANSISTOR
Q79	DTC144EU	TRANSISTOR
Q80	2SA1576(QRS)	TRANSISTOR
Q81	DTC144EU	TRANSISTOR
Q82	DTC144EU	TRANSISTOR
Q83	DTC144EU	TRANSISTOR
Q84	2SC4098(PQ)	TRANSISTOR
Q85	DTA144EU	TRANSISTOR
Q86	DTA144EU	TRANSISTOR
Q87	DTC144EU	TRANSISTOR
Q92	DTC144EU	TRANSISTOR
Q93	DTC144EU	TRANSISTOR
Q94	DTC144EU	TRANSISTOR
Q95	DTC144EU	TRANSISTOR
Q97	DTC144EU	TRANSISTOR
Q99	2SA1576(QRS)	TRANSISTOR
Q100	DTC144EU	TRANSISTOR
Q101	DTC144EU	TRANSISTOR
Q103	2SC4081(QRS)	TRANSISTOR
Q104	2SC4081(QRS)	TRANSISTOR
Q105	2SA1576(QRS)	TRANSISTOR
Q106	DTA124EU	TRANSISTOR
Q108	DTC144WU	TRANSISTOR
Q109	2SC4081(QRS)	TRANSISTOR
Q110	2SC4081(QRS)	TRANSISTOR
Q111	2SC4081(QRS)	TRANSISTOR
Q113	2SA1576(QRS)	TRANSISTOR
Q114	2SC4081(QRS)	TRANSISTOR
Q115	2SA1576(QRS)	TRANSISTOR
Q116	2SC4081(QRS)	TRANSISTOR
Q117	DTC144EU	TRANSISTOR
Q118	2SA1576(QRS)	TRANSISTOR
Q122	DTC144EU	TRANSISTOR
Q123	DTC144EU	TRANSISTOR
Q124	DTA144EU	TRANSISTOR
Q125	DTC144EU	TRANSISTOR
Q131	DTC144EU	TRANSISTOR
Q133	DTC144EU	TRANSISTOR
Q135	2SC4081(QRS)	TRANSISTOR
Q136	2SA1576(QRS)	TRANSISTOR
Q137	2SA1576(QRS)	TRANSISTOR
Q138	2SC4081(QRS)	TRANSISTOR
Q139	2SA1576(QRS)	TRANSISTOR
Q140	2SA1576(QRS)	TRANSISTOR
Q141	DTC144EU	TRANSISTOR
Q143	DTC144EU	TRANSISTOR
Q145	DTC124EU	TRANSISTOR
Q200	2SC4081(QRS)	TRANSISTOR
Q201	2SC4081(QRS)	TRANSISTOR
Q202	2SA1576(QRS)	TRANSISTOR
Q203	2SA1576(QRS)	TRANSISTOR
Q204	2SC4081(QRS)	TRANSISTOR
Q205	2SA1576(QRS)	TRANSISTOR
Q206	2SA1576(QRS)	TRANSISTOR
Q207	2SC4081(QRS)	TRANSISTOR
Q208	2SA1576(QRS)	TRANSISTOR
Q209	2SC4081(QRS)	TRANSISTOR
Q210	DTC144EU	TRANSISTOR
Q211	2SC4081(QRS)	TRANSISTOR
Q212	2SC4081(QRS)	TRANSISTOR
Q213	DTC144EU	TRANSISTOR
Q214	DTC144EU	TRANSISTOR
Q215	DTC144EU	TRANSISTOR
Q216	2SC4081(QRS)	TRANSISTOR
Q217	2SA1576(QRS)	TRANSISTOR

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
Q218	2SC4081(QRS)	TRANSISTOR
Q219	2SC4081(QRS)	TRANSISTOR
Q221	DTC144EU	TRANSISTOR
Q222	2SC4081(QRS)	TRANSISTOR
Q223	DTA144EU	TRANSISTOR
Q401	2SC4081(QRS)	TRANSISTOR
Q402	2SC4098(PQ)	TRANSISTOR
Q403	2SC4081(QRS)	TRANSISTOR
Q404	2SA1576(QRS)	TRANSISTOR
Q405	DTC124EU	TRANSISTOR
Q406	DTC144EU	TRANSISTOR
Q407	DTC124EU	TRANSISTOR
Q408	DTA144EU	TRANSISTOR
Q409	DTC144WU	TRANSISTOR
Q410	DTC114EU	TRANSISTOR
Q411	DTC114EU	TRANSISTOR
Q412	DTC144WU	TRANSISTOR
Q426	2SA1576(QRS)	TRANSISTOR
Q429	2SC4081(QRS)	TRANSISTOR
Q430	DTC144EU	TRANSISTOR
Q431	2SC4081(QRS)	TRANSISTOR
Q432	DTC144EU	TRANSISTOR
D14	DAN202U	DIODE
D19	DAN202U	DIODE
D20	DAN202U	DIODE
D21	DAN202U	DIODE
D22	DAN202U	DIODE
D23	DAN202U	DIODE
D25	DAP202U	DIODE
D26	DAN202U	DIODE
D27	DAN202U	DIODE
D28	DAN202U	DIODE
D29	DAN202U	DIODE
D30	DAN202U	DIODE
D31	DAN202U	DIODE
D33	DAN202U	DIODE
D35	DAN202U	DIODE
D36	DAN202U	DIODE
D37	DAN202U	DIODE
D100	DAN202U	DIODE
D101	DAN202U	DIODE
D103	DAN202U	DIODE
D401	DAN202U	DIODE
D402	DAN202U	DIODE
D403	DAN202U	DIODE
D404	DAN202U	DIODE
D405	DAN202U	DIODE
D406	DAN202U	DIODE
D407	DAN202U	DIODE
D408	DAN202U	DIODE

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
D411	DAN202U	DIODE	
D413	DAN202U	DIODE	
R81	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R99	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R100	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R101	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R102	NRSA63J-681N	RESISTOR	680Ω,1/16W
R103	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R104	NVP1301-332N	V RESISTOR, CCD GAIN	3.3KΩ
R105	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R106	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R107	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R109	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R110	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R111	NRSA63J-105N	RESISTOR	1MΩ,1/16W
R112	QRSA08J-475YN	RESISTOR	4.7MΩ,1/10W
R113	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R142	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R143	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R149	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R150	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R151	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R152	NRSA63J-221N	RESISTOR	220Ω,1/16W
R153	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R154	NRSA63J-221N	RESISTOR	220Ω,1/16W
R155	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R163	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R164	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R165	NRSA63J-153N	RESISTOR	15KΩ,1/16W
R166	NRSA63J-823N	RESISTOR	82KΩ,1/16W
R167	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R168	NVP1301-102N	V RESISTOR, REC FM LEVEL	1KΩ
R170	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R171	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R172	NRSA63J-681N	RESISTOR	680Ω,1/16W
R173	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R174	NRSA63J-471N	RESISTOR	470Ω,1/16W
R175	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R176	NRSA63J-153N	RESISTOR	15KΩ,1/16W
R178	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R179	NVP1301-102N	V RESISTOR, S REC FM LEVEL	1KΩ
R180	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R181	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R182	NRSA63J-391N	RESISTOR	390Ω,1/16W
R183	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R185	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R186	NRSA63J-271N	RESISTOR	270Ω,1/16W
R187	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R188	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R189	NRSA63J-101N	RESISTOR	100Ω,1/16W
R190	NRSA63J-820N	RESISTOR	82Ω,1/16W

< 02 >

#△ REF No.	PART No.	PART NAME, DESCRIPTION
R191	NRSA63J-0R0A	RESISTOR 0Ω,1/16W
R193	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R194	NRSA63J-472N	RESISTOR 4.7KΩ,1/16W
R195	NRSA63J-392N	RESISTOR 3.9KΩ,1/16W
R196	NRSA63J-562N	RESISTOR 5.6KΩ,1/16W
R197	NRSA63J-561N	RESISTOR 560Ω,1/16W
R198	NRSA63J-272N	RESISTOR 2.7KΩ,1/16W
R199	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R200	NVP1301-103N	V RESISTOR, PB Y LEVEL 10KΩ
R201	NVP1301-103N	V RESISTOR, S PB Y LEVEL 10KΩ
R202	NRSA63J-391N	RESISTOR 390Ω,1/16W
R203	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R204	NRSA63J-681N	RESISTOR 680Ω,1/16W
R205	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R206	NRSA63J-123N	RESISTOR 12KΩ,1/16W
R207	NRSA63J-562N	RESISTOR 5.6KΩ,1/16W
R208	NRSA63J-333N	RESISTOR 33KΩ,1/16W
R209	NRSA63J-223N	RESISTOR 22KΩ,1/16W
R210	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R211	NRSA63J-222N	RESISTOR 2.2KΩ,1/16W
R212	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R213	NRSA63J-473N	RESISTOR 47KΩ,1/16W
R214	NRSA63J-562N	RESISTOR 5.6KΩ,1/16W
R215	NRSA63J-122N	RESISTOR 1.2KΩ,1/16W
R216	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R219	NRSA63J-333N	RESISTOR 33KΩ,1/16W
R220	NRSA63J-121N	RESISTOR 120Ω,1/16W
R221	NRSA63J-820N	RESISTOR 82Ω,1/16W
R222	NVP1301-223N	V RESISTOR, CARRIER 22KΩ
R223	NVP1301-223N	V RESISTOR, S CARRIER 22KΩ
R224	NVP1301-103N	V RESISTOR, S DEVIATION 10KΩ
R225	NVP1301-103N	V RESISTOR, DEVIATION 10KΩ
R226	NRSA63J-272N	RESISTOR 2.7KΩ,1/16W
R227	NRSA63J-681N	RESISTOR 680Ω,1/16W
R234	NRSA63J-473N	RESISTOR 47KΩ,1/16W
R235	NRSA63J-473N	RESISTOR 47KΩ,1/16W
R236	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R237	NVP1301-153N	TRIMMING RESISTOR, EE Y LEVEL
R238	NRSA63J-471N	RESISTOR 470Ω,1/16W
R239	NRSA63J-153N	RESISTOR 15KΩ,1/16W
R242	NRSA63J-561N	RESISTOR 560Ω,1/16W
R243	NRSA63J-391N	RESISTOR 390Ω,1/16W
R244	NVP1301-472N	V RESISTOR, S WHITE CLIP 4.7KΩ
R245	NVP1301-103N	V RESISTOR, WHITE CLIP 10KΩ
R246	NRSA63J-272N	RESISTOR 2.7KΩ,1/16W
R247	NVP1301-472N	V RESISTOR, DARK CLIP 4.7KΩ
R248	NVP1301-103N	V RESISTOR, S DARK CLIP 10KΩ
R249	NRSA63J-562N	RESISTOR 5.6KΩ,1/16W
R251	NRSA63J-821N	RESISTOR 820Ω,1/16W
R252	NRSA63J-151N	RESISTOR 150Ω,1/16W
R253	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R254	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R256	NRSA63J-561N	RESISTOR 560Ω,1/16W
R257	NRSA63J-152N	RESISTOR 1.5KΩ,1/16W
R258	NRSA63J-681N	RESISTOR 680Ω,1/16W
R259	NRSA63J-122N	RESISTOR 1.2KΩ,1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION
R260	NRSA63J-561N	RESISTOR 560Ω,1/16W
R261	NRSA63J-561N	RESISTOR 560Ω,1/16W
R262	NVP1301-472N	V RESISTOR, S PB RF EQ 4.7KΩ
R264	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R265	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R266	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R267	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R268	NRSA63J-223N	RESISTOR 22KΩ,1/16W
R269	NRSA63J-273N	RESISTOR 27KΩ,1/16W
R270	NRSA63J-471N	RESISTOR 470Ω,1/16W
R271	NRSA63J-103N	RESISTOR 10KΩ,1/16W
R272	NRSA63J-223N	RESISTOR 22KΩ,1/16W
R273	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R275	NRSA63J-561N	RESISTOR 560Ω,1/16W
R276	NRSA63J-222N	RESISTOR 2.2KΩ,1/16W
R277	NRSA63J-101N	RESISTOR 100Ω,1/16W
R278	NVP1301-682N	V RESISTOR, PB RF EQ 6.8KΩ
R279	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R280	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R281	NRSA63J-751N	RESISTOR 750Ω,1/16W
R282	NRSA63J-561N	RESISTOR 560Ω,1/16W
R283	NRSA63J-821N	RESISTOR 820Ω,1/16W
R284	NRSA63J-152N	RESISTOR 1.5KΩ,1/16W
R285	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R286	NRSA63J-331N	RESISTOR 330Ω,1/16W
R287	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R288	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R289	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R290	NRSA63J-152N	RESISTOR 1.5KΩ,1/16W
R291	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R292	NRSA63J-471N	RESISTOR 470Ω,1/16W
R293	NRSA63J-272N	RESISTOR 2.7KΩ,1/16W
R294	NRSA63J-392N	RESISTOR 3.9KΩ,1/16W
R295	NRSA63J-823N	RESISTOR 82KΩ,1/16W
R296	NRSA63G-102N	RESISTOR 1KΩ,1/16W
R297	NVP1301-103N	V RESISTOR, LIMITTER BALANCE 10KΩ
R298	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R299	NRSA63G-102N	RESISTOR 1KΩ,1/16W
R300	NRSA63J-471N	RESISTOR 470Ω,1/16W
R301	NRSA63G-152N	RESISTOR 1.5KΩ,1/16W
R302	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R303	NRSA63G-332N	RESISTOR 3.3KΩ,1/16W
R304	NRSA63J-102N	RESISTOR 1KΩ,1/16W
R305	NRSA63G-332N	RESISTOR 3.3KΩ,1/16W
R306	NRSA63J-222N	RESISTOR 2.2KΩ,1/16W
R307	QRSA08J-0R0Y	RESISTOR 0Ω,1/10W
R308	NRSA63J-473N	RESISTOR 47KΩ,1/16W
R309	NRSA63J-121N	RESISTOR 120Ω,1/16W
R310	NRSA63J-271N	RESISTOR 270Ω,1/16W
R311	NRSA63J-152N	RESISTOR 1.5KΩ,1/16W
R312	NRSA63J-391N	RESISTOR 390Ω,1/16W
R313	NVP1301-471N	V RESISTOR, S NL EMPHA INPUT 470Ω
R314	NRSA63J-821N	RESISTOR 820Ω,1/16W
R316	NVP1301-103N	V RESISTOR, S NL EMPHA OUTPUT 10KΩ
R317	NVP1301-102N	V RESISTOR, EE BURST LEVEL 1KΩ
R318	NRSA63J-681N	RESISTOR 680Ω,1/16W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R319	NRSA63J-561N	RESISTOR	560Ω,1/16W
R320	NRSA63J-181N	RESISTOR	180Ω,1/16W
R321	NRSA63J-821N	RESISTOR	820Ω,1/16W
R326	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R327	NRSA63J-155N	RESISTOR	1.5MΩ,1/16W
R328	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
R329	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
R330	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
R331	NRSA63J-561N	RESISTOR	560Ω,1/16W
R333	NRSA63J-334N	RESISTOR	330KΩ,1/16W
R337	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R338	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R343	NRSA63J-331N	RESISTOR	330Ω,1/16W
R345	NRSA63J-561N	RESISTOR	560Ω,1/16W
R346	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R347	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R349	NRSA63J-101N	RESISTOR	100Ω,1/16W
R355	NRSA63J-563N	RESISTOR	56KΩ,1/16W
R356	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R357	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R358	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R359	NRSA63J-101N	RESISTOR	100Ω,1/16W
R360	NRSA63J-561N	RESISTOR	560Ω,1/16W
R361	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R362	NRSA63J-563N	RESISTOR	56KΩ,1/16W
R363	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R364	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R365	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R366	NRSA63J-101N	RESISTOR	100Ω,1/16W
R367	NRSA63J-561N	RESISTOR	560Ω,1/16W
R368	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R369	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R370	NRSA63J-683N	RESISTOR	68KΩ,1/16W
R371	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R372	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R401	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R402	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R403	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R404	NRSA63J-331N	RESISTOR	330Ω,1/16W
R405	NRSA63J-221N	RESISTOR	220Ω,1/16W
R406	NRSA63J-331N	RESISTOR	330Ω,1/16W
R407	NRSA63J-471N	RESISTOR	470Ω,1/16W
R408	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R409	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R410	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R411	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R412	NRSA63J-821N	RESISTOR	820Ω,1/16W
R413	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R414	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R415	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R416	NRSA63J-104N	RESISTOR	100KΩ,1/16W
R417	NRSA63J-151N	RESISTOR	150Ω,1/16W
R418	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R419	NRSA63J-101N	RESISTOR	100Ω,1/16W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R420	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R421	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R422	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R423	NRSA63J-225N	RESISTOR	2.2MΩ,1/16W
R424	NRSA63J-821N	RESISTOR	820Ω,1/16W
R425	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R426	NRSA63J-391N	RESISTOR	390Ω,1/16W
R427	NRSA63J-471N	RESISTOR	470Ω,1/16W
R428	NRSA63J-183N	RESISTOR	18KΩ,1/16W
R429	NRSA63J-183N	RESISTOR	18KΩ,1/16W
R430	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R431	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R432	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R439	NVP1301-472N	V RESISTOR, PILOT BURST LEVEL	4.7KΩ
R440	NRSA63J-471N	RESISTOR	470Ω,1/16W
R441	NRSA63J-181N	RESISTOR	180Ω,1/16W
R442	NRSA63J-823N	RESISTOR	82KΩ,1/16W
R443	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R444	NRSA63J-751N	RESISTOR	750Ω,1/16W
R446	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R447	NRSA63J-561N	RESISTOR	560Ω,1/16W
R448	NRSA63J-471N	RESISTOR	470Ω,1/16W
R449	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R450	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R451	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R452	NRSA63J-561N	RESISTOR	560Ω,1/16W
R453	NRSA63J-471N	RESISTOR	470Ω,1/16W
R455	NRSA63J-561N	RESISTOR	560Ω,1/16W
R457	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R458	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R459	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R498	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R499	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R500	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R501	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
R502	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
R602	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R603	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R604	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R605	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R606	NRSA63J-331N	RESISTOR	330Ω,1/16W
R607	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R608	NVP1301-103N	V RESISTOR, BURST GATE	10KΩ
R609	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R610	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R611	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R612	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R613	NRSA63J-821N	RESISTOR	820Ω,1/16W
R614	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R615	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R616	NVP1301-152N	V RESISTOR, S-VHS C.D.L	1.5KΩ
R617	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R618	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R619	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R620	NRSA63J-102N	RESISTOR	1KΩ,1/16W

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#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	R621	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R622	NVP1301-152N	V RESISTOR, VHS C.D.L	1.5KΩ
	R623	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R624	NVP1301-681N	V RESISTOR, REC C LEVEL	680Ω
	R625	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R626	NVP1301-222N	V RESISTOR, S REC C LEVEL	2.2KΩ
	R627	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R628	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R629	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R630	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R632	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R633	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
	R634	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R635	NRSA63J-181N	RESISTOR	180Ω,1/16W
	R636	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R640	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R641	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
	R642	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
	R643	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R644	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R645	NRSA63J-123N	RESISTOR	12KΩ,1/16W
	R646	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R647	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
	R648	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R649	NVP1301-102N	V RESISTOR, PB C LEVEL	1KΩ
	R650	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R651	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R652	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R653	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R654	NRSA63J-102N	RESISTOR	180Ω,1/16W
	R655	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R656	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R657	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
	R658	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R661	NRSA63J-561N	RESISTOR	560Ω,1/16W
	R662	NRSA63J-221N	RESISTOR	220Ω,1/16W
	R663	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R664	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R665	ERT-D2FGL301S	THERMISTOR	
	R666	NRSA63J-471N	RESISTOR	470Ω,1/16W
⚠	R669	ERT-D2FFL400S	THERMISTOR	
	R670	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R671	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
	R672	NRSA63J-223N	RESISTOR	22KΩ,1/16W
	R673	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R674	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R675	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
	R677	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R678	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R679	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
	R700	QRD161J-681	RESISTOR	680Ω,1/6W
	C75	QERF1CM-106	E CAPACITOR	10μF,16V
	C76	QEPA0JM-476	NP E CAPACITOR	47μF,6.3V
	C78	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C79	QER40JM-476	E CAPACITOR	47μF,6.3V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C80	QEPA1HM-104	NP E CAPACITOR	0.1μF,50V
	C81	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C82	QERF1HM-474	E CAPACITOR	0.47μF,50V
	C83	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C84	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C85	QERF1CM-336	E CAPACITOR	33μF,16V
	C97	YU41491-104	M CAPACITOR	0.1μF
	C101	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
	C104	QER41AM-336	E CAPACITOR	33μF,10V
	C105	QERF1HM-334	E CAPACITOR	0.33μF,50V
	C106	QEE41CM-106	TANTAL CAPACITOR	10μF,16V
	C107	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C108	NCS31HJ-121A	CAPACITOR	120PF,50V
	C109	NCB31HK-331A	CAPACITOR	330PF,50V
	C110	NCS31HJ-121A	CAPACITOR	120PF,50V
	C111	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C112	NCS31HJ-560A	CAPACITOR	56PF,50V
	C113	NCB31HK-271A	CAPACITOR	270PF,50V
	C114	NCS31HJ-151A	CAPACITOR	150PF,50V
	C115	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C121	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C122	QERF0JM-476	E CAPACITOR	47μF,6.3V
	C123	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C124	QERF1HM-104	E CAPACITOR	0.1μF,50V
	C125	NCS31HJ-121A	CAPACITOR	120PF,50V
	C126	NCS31HJ-121A	CAPACITOR	120PF,50V
	C127	NCS31HJ-150A	CAPACITOR	15PF,50V
	C128	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C129	QERF0JM-476	E CAPACITOR	47μF,6.3V
	C130	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C131	NCS31HJ-7R0A	CAPACITOR	7PF,50V
	C132	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C133	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C134	NCS31HJ-6R0A	CAPACITOR	6PF,50V
	C135	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C136	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C137	QERF1CM-476	E CAPACITOR	47μF,16V
	C138	QCYA1EK-223	CHIP.C CAPACITOR	0.022μF,25V
	C139	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C140	QERF1HM-105	E CAPACITOR	1μF,50V
	C141	NCS31HJ-470A	CAPACITOR	47PF,50V
	C142	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C143	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C144	QERF0JM-107	E CAPACITOR	100μF,6.3V
	C145	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C146	NCT08CH-680A	CAPACITOR	68PF
	C147	NCT08CH-331A	CAPACITOR	330PF
	C148	NCT08CH-180A	CAPACITOR	18PF
	C149	NCT08CH-820A	CAPACITOR	82PF
	C150	NCS31HJ-271A	CAPACITOR	270PF,50V
	C151	NCS31HJ-101A	CAPACITOR	100PF,50V
	C152	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C153	NCS31HJ-390A	CAPACITOR	39PF,50V
	C154	NRSA63J-0R0A	RESISTOR	0Ω,1/16W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C155	NCS31HJ-100A	CAPACITOR	10PF,50V
C156	NCB31EK-103A	CAPACITOR	0.01μF,25V
C157	NCB31EK-103A	CAPACITOR	0.01μF,25V
C158	QERF1HM-224	E CAPACITOR	0.22μF,50V
C159	NCB31EK-103A	CAPACITOR	0.01μF,25V
C162	NCS31HJ-560A	CAPACITOR	56PF,50V
C163	QERF0JM-107	E CAPACITOR	100μF,6.3V
C164	NCB31EK-103A	CAPACITOR	0.01μF,25V
C165	NCB31EK-103A	CAPACITOR	0.01μF,25V
C166	NCB31CK-273A	CAPACITOR	0.027μF,16V
C167	NCB31EK-103A	CAPACITOR	0.01μF,25V
C168	NCS31HJ-470A	CAPACITOR	47PF,50V
C171	QEF80JM-225	TANTAL CAPACITOR	2.2μF,6.3V
C172	QEF80JM-225	TANTAL CAPACITOR	2.2μF,6.3V
C173	QEF81AM-475	TANTAL CAPACITOR	4.7μF,10V
C174	QEPA0JM-476	NP E CAPACITOR	47μF,6.3V
C175	QER41EM-475	E CAPACITOR	4.7μF,25V
C176	QEF81VM-474	TANTAL CAPACITOR	0.47μF,35V
C177	QER41EM-475	E CAPACITOR	4.7μF,25V
C178	QER41HM-474	E CAPACITOR	0.47μF,50V
C180	QER41HM-474	E CAPACITOR	0.47μF,50V
C181	NCB31EK-103A	CAPACITOR	0.01μF,25V
C182	NCS31HJ-820A	CAPACITOR	82PF,50V
C183	QERF1CM-106	E CAPACITOR	10μF,16V
C185	QERF0JM-476	E CAPACITOR	47μF,6.3V
C186	NCS31HJ-180A	CAPACITOR	18PF,50V
C188	NCS31HJ-561A	CAPACITOR	560PF,50V
C189	NCS31HJ-180A	CAPACITOR	18PF,50V
C190	NCS31HJ-180A	CAPACITOR	18PF,50V
C191	NCB31EK-103A	CAPACITOR	0.01μF,25V
C192	NCS31HJ-390A	CAPACITOR	39PF,50V
C193	NCB31EK-103A	CAPACITOR	0.01μF,25V
C194	QERF0JM-476	E CAPACITOR	47μF,6.3V
C195	NCS31HJ-100A	CAPACITOR	10PF,50V
C196	NCB31EK-103A	CAPACITOR	0.01μF,25V
C197	NCB31EK-103A	CAPACITOR	0.01μF,25V
C198	NCB31EK-103A	CAPACITOR	0.01μF,25V
C199	NCB31EK-103A	CAPACITOR	0.01μF,25V
C200	NCS31HJ-470A	CAPACITOR	47PF,50V
C201	NCB31EK-103A	CAPACITOR	0.01μF,25V
C202	QCFA1EZ-104	CHIP.C CAPACITOR	
C203	NCS31HJ-120A	CAPACITOR	12PF,50V
C205	NCS31HJ-270A	CAPACITOR	27PF,50V
C206	NCS31HJ-150A	CAPACITOR	15PF,50V
C207	NCS31HJ-560A	CAPACITOR	56PF,50V
C208	NCS31HJ-470A	CAPACITOR	47PF,50V
C209	NCB31EK-103A	CAPACITOR	0.01μF,25V
C210	NCT08CH-221A	CAPACITOR	220PF
C211	NCT08CH-820A	CAPACITOR	82PF
C212	NCT08CH-271A	CAPACITOR	270PF
C213	NCT08CH-271A	CAPACITOR	270PF
C214	QERF0JM-476	E CAPACITOR	47μF,6.3V
C216	QERF1EM-475	E CAPACITOR	4.7μF,25V
C217	QERF1EM-475	E CAPACITOR	4.7μF,25V
C218	QERF1EM-475	E CAPACITOR	4.7μF,25V
C219	QEE81AM-106	TANTAL CAPACITOR	10μF,10V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C220	YU40173-271Z	CAPACITOR	270PF
C221	YU40173-820Z	CAPACITOR	82PF
C222	YU40173-221Z	CAPACITOR	220PF
C223	YU40173-271Z	CAPACITOR	270PF
C224	YU40173-271Z	CAPACITOR	270PF
C225	QERF0JM-476	E CAPACITOR	47μF,6.3V
C226	NCB31EK-103A	CAPACITOR	0.01μF,25V
C227	NCS31HJ-271A	CAPACITOR	270PF,50V
C238	QERF1EM-335	E CAPACITOR	3.3μF,25V
C241	NCS31HJ-181A	CAPACITOR	180PF,50V
C242	QER40JM-227	E CAPACITOR	220μF,6.3V
C244	YU41491-104	M CAPACITOR	0.1μF
C246	NCB31EK-103A	CAPACITOR	0.01μF,25V
C247	NCB31EK-103A	CAPACITOR	0.01μF,25V
C249	NCS31HJ-120A	CAPACITOR	12PF,50V
C250	NCS31HJ-820A	CAPACITOR	82PF,50V
C251	NCS31HJ-820A	CAPACITOR	82PF,50V
C252	NCB31EK-103A	CAPACITOR	0.01μF,25V
C253	QEF81AM-476	TANTAL CAPACITOR	47μF,10V
C254	QCYA1EK-104	CAPACITOR	0.1μF,25V
C255	NCS31HJ-181A	CAPACITOR	180PF,50V
C257	NCB31EK-103A	CAPACITOR	0.01μF,25V
C260	QCYA1EK-104	CAPACITOR	0.1μF,25V
C262	NCS31HJ-330A	CAPACITOR	33PF,50V
C300	NCB31EK-103A	CAPACITOR	0.01μF,25V
C301	NCB31EK-103A	CAPACITOR	0.01μF,25V
C302	NCB31EK-103A	CAPACITOR	0.01μF,25V
C303	NCB31EK-103A	CAPACITOR	0.01μF,25V
C304	QERF0JM-476	E CAPACITOR	47μF,6.3V
C305	NCB31EK-103A	CAPACITOR	0.01μF,25V
C306	NCB31EK-103A	CAPACITOR	0.01μF,25V
C307	QERF0JM-476	E CAPACITOR	47μF,6.3V
C308	NCB31EK-103A	CAPACITOR	0.01μF,25V
C309	NCB31EK-103A	CAPACITOR	0.01μF,25V
C311	NCB31EK-103A	CAPACITOR	0.01μF,25V
C312	QERF0JM-476	E CAPACITOR	47μF,6.3V
C313	QERF0JM-476	E CAPACITOR	47μF,6.3V
C314	NCB31EK-103A	CAPACITOR	0.01μF,25V
C315	NCB31EK-103A	CAPACITOR	0.01μF,25V
C316	QERF0JM-476	E CAPACITOR	47μF,6.3V
C317	NCB31EK-103A	CAPACITOR	0.01μF,25V
C318	QERF0JM-476	E CAPACITOR	47μF,6.3V
C319	NCS31HJ-391A	CAPACITOR	390PF,50V
C320	NCB31EK-103A	CAPACITOR	0.01μF,25V
C321	QERF0JM-476	E CAPACITOR	47μF,6.3V
C322	NCB31EK-103A	CAPACITOR	0.01μF,25V
C323	NCB31EK-103A	CAPACITOR	0.01μF,25V
C324	QEE41CM-225	T CAPACITOR	2.2μF,16V
C325	QEE40JM-476	T CAPACITOR	47μF,6.3V
C326	NCB31EK-103A	CAPACITOR	0.01μF,25V
C327	QERF0JM-476	E CAPACITOR	47μF,6.3V
C329	NCB31EK-103A	CAPACITOR	0.01μF,25V
C330	NCS31HJ-151A	CAPACITOR	150PF,50V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C331	NCB31EK-103A	CAPACITOR	0.01μF,25V
C332	QERF0JM-476	E CAPACITOR	47μF,6.3V
C333	NCB31EK-103A	CAPACITOR	0.01μF,25V
C334	NCS31HJ-151A	CAPACITOR	150PF,50V
C335	NCB31EK-103A	CAPACITOR	0.01μF,25V
C336	QERF0JM-476	E CAPACITOR	47μF,6.3V
C337	NCB31EK-103A	CAPACITOR	0.01μF,25V
C338	NCB31EK-103A	CAPACITOR	0.01μF,25V
C339	NCB31EK-103A	CAPACITOR	0.01μF,25V
C340	NCB31EK-103A	CAPACITOR	0.01μF,25V
C341	NCB31EK-103A	CAPACITOR	0.01μF,25V
C342	NCB31EK-103A	CAPACITOR	0.01μF,25V
C343	NCT08CH-271A	CAPACITOR	270PF
C344	NCT08CH-121A	CAPACITOR	120PF
C345	NCT08CH-680A	CAPACITOR	68PF
C346	NCB31EK-103A	CAPACITOR	0.01μF,25V
C348	NCS31HJ-180A	CAPACITOR	18PF,50V
C349	QEE41CM-106	TANTAL CAPACITOR	10μF,16V
C350	NCB31EK-103A	CAPACITOR	0.01μF,25V
C351	NCB31EK-103A	CAPACITOR	0.01μF,25V
C352	NCB31EK-103A	CAPACITOR	0.01μF,25V
C353	NCB31EK-103A	CAPACITOR	0.01μF,25V
C354	QERF0JM-476	E CAPACITOR	47μF,6.3V
C355	NCS31HJ-151A	CAPACITOR	150PF,50V
C356	QEE41VM-105	TANTAL CAPACITOR	1μF,35V
C361	NCS31HJ-470A	CAPACITOR	47PF,50V
C362	NCS31HJ-331A	CAPACITOR	330PF,50V
C363	NCS31HJ-151A	CAPACITOR	150PF,50V
C364	NCS31HJ-221A	CAPACITOR	220PF,50V
C365	NCS31HJ-390A	CAPACITOR	39PF,50V
C367	NCS31HJ-220A	CAPACITOR	22PF,50V
C368	NCS31HJ-560A	CAPACITOR	56PF,50V
C369	NCB31EK-103A	CAPACITOR	0.01μF,25V
C370	NCB31EK-103A	CAPACITOR	0.01μF,25V
C371	NCB31EK-103A	CAPACITOR	0.01μF,25V
C372	NCB31EK-103A	CAPACITOR	0.01μF,25V
C374	NCS31HJ-471A	CAPACITOR	470PF,50V
C375	QER41HM-105	E CAPACITOR	1μF,50V
C380	QCS11HJ-101	CAPACITOR	100PF,50V
C401	NCB31EK-103A	CAPACITOR	0.01μF,25V
C402	NCS31HJ-221A	CAPACITOR	220PF,50V
C403	NCB31EK-103A	CAPACITOR	0.01μF,25V
C404	NCB31EK-103A	CAPACITOR	0.01μF,25V
C405	QCFA1EZ-683	CHIP.C CAPACITOR	0.068μF,25V
C406	QER40JM-107	E CAPACITOR	100μF,6.3V
C407	QERF1EM-335	E CAPACITOR	3.3μF,25V
C408	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
C409	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
C410	NCS31HJ-470A	CAPACITOR	47PF,50V
C411	NCS31HJ-9R0A	CAPACITOR	9PF,50V
C412	NCB31EK-103A	CAPACITOR	0.01μF,25V
C413	QERF0JM-107	E CAPACITOR	100μF,6.3V
C414	QCYA1HJ-153	CHIP.C CAPACITOR	0.015μF,50V
C415	QFN41HJ-563	M CAPACITOR	0.056μF,50V
C416	QFN41HJ-104	M CAPACITOR	0.1μF,50V
C417	QERF1EM-475	E CAPACITOR	4.7μF,25V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C418	QERF1HM-104	E CAPACITOR	0.1μF,50V
C419	QCSA1HJ-391	CHIP.C CAPACITOR	390PF,50V
C420	QERF1HM-105	E CAPACITOR	1μF,50V
C421	NCS31HJ-101A	CAPACITOR	100PF,50V
C423	NCB31EK-103A	CAPACITOR	0.01μF,25V
C424	NCS31HJ-180A	CAPACITOR	18PF,50V
C425	QERF1HM-104	E CAPACITOR	0.1μF,50V
C426	NCB31EK-103A	CAPACITOR	0.01μF,25V
C427	NCB31EK-103A	CAPACITOR	0.01μF,25V
C428	NCB31EK-103A	CAPACITOR	0.01μF,25V
C429	NCB31EK-103A	CAPACITOR	0.01μF,25V
C430	NCB31EK-103A	CAPACITOR	0.01μF,25V
C431	QERF0JM-107	E CAPACITOR	100μF,6.3V
C432	NCB31EK-103A	CAPACITOR	0.01μF,25V
C433	NCB31EK-103A	CAPACITOR	0.01μF,25V
C434	QER41HM-104	E CAPACITOR	0.1μF,50V
C435	NCB31EK-103A	CAPACITOR	0.01μF,25V
C436	QERF1HM-474	E CAPACITOR	0.47μF,50V
C437	QERF1HM-474	E CAPACITOR	0.47μF,50V
C438	NCB31EK-103A	CAPACITOR	0.01μF,25V
C439	QER41CM-106	E CAPACITOR	10μF,16V
C440	QER41CM-106	E CAPACITOR	10μF,16V
C441	NCB31EK-103A	CAPACITOR	0.01μF,25V
C448	NCS31HJ-390A	CAPACITOR	39PF,50V
C449	NCB31EK-103A	CAPACITOR	0.01μF,25V
C450	QERF1HM-105	E CAPACITOR	1μF,50V
C451	NCB31EK-103A	CAPACITOR	0.01μF,25V
C452	QERF1HM-105	E CAPACITOR	1μF,50V
C453	NCB31EK-103A	CAPACITOR	0.01μF,25V
C454	QFN41HJ-223	M CAPACITOR	0.022μF,50V
C455	NCB31EK-103A	CAPACITOR	0.01μF,25V
C456	NCS31HJ-101A	CAPACITOR	100PF,50V
C457	NCB31EK-103A	CAPACITOR	0.01μF,25V
C458	QERF0JM-107	E CAPACITOR	100μF,6.3V
C459	NCB31EK-103A	CAPACITOR	0.01μF,25V
C461	QERF0JM-476	E CAPACITOR	47μF,6.3V
C462	NCB31EK-103A	CAPACITOR	0.01μF,25V
C463	NCB31HK-102A	CAPACITOR	0.001μF,50V
C466	QCYA1HK-103	CHIP.C CAPACITOR	0.01μF,50V
C468	NCS31HJ-560A	CAPACITOR	56PF,50V
C469	NCR21CK-473A	CAPACITOR	0.047μF,16V
C470	NCS31HJ-390A	CAPACITOR	39PF,50V
C471	NCS31HJ-330A	CAPACITOR	33PF,50V
C475	QERF1HM-105	E CAPACITOR	1μF,50V
C502	NCS31HJ-560A	CAPACITOR	56PF,50V
C504	NCS31HJ-8R0A	CAPACITOR	8PF,50V
L4	YU41135-470	COIL	47μH
L5	PU58201-560J	COIL	56μH
L6	YU41135-470	COIL	47μH
L13	PU58201-100J	COIL	10μH
	or YU41134-100JY	COIL	10μH
L14	YU41135-470	COIL	47μH

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
L15	PU58201-560J	COIL	56μH
L17	YU41135-470	COIL	47μH
L18	YU41135-470	COIL	47μH
L19	YU41135-470	COIL	47μH
L20	YU41135-470	COIL	47μH
L21	YU41135-470	COIL	47μH
L22	YU41135-470	COIL	47μH
L27	YU41135-470	COIL	47μH
L28	PU58201-330J	COIL	33μH
L29	PU58201-181J	COIL	180μH
L30	PU58201-820J	COIL	82μH
L31	PU58201-101J	COIL	100μH
L32	PU58201-330J	COIL	33μH
L34	YU41135-470	COIL	47μH
L35	PU58201-470J	COIL	47μH
L36	PU58201-221J	COIL	220μH
L37	YU41135-470	COIL	47μH
L38	PU58201-560J	COIL	56μH
L39	PU58201-270J	COIL	27μH
L40	YU41135-470	COIL	47μH
L41	PU58201-4R7K	COIL	4.7μH
L42	YU41135-470	COIL	47μH
L43	YU41135-470	COIL	47μH
L44	PU58201-180J	COIL	18μH
L47	YU41135-470	COIL	47μH
L48	PU58201-100J	COIL	10μH
L49	PU58201-221J	COIL	220μH
L50	PU58201-390J	COIL	39μH
L51	PU58201-220J	COIL	22μH
L52	PU58201-820J	COIL	82μH
L53	PU58201-220J	COIL	22μH
L54	PU58201-220J	COIL	22μH
L55	PU58201-560J	COIL	56μH
L56	PU58201-470J	COIL	47μH
L57	PU58201-220J	COIL	22μH
L58	YU41135-470	COIL	47μH
L59	YU41135-470	COIL	47μH
L60	PU58201-221J	COIL	220μH
L61	YU41135-101KY	COIL	100μH
	or YU40248-101KY	COIL	100μH
L100	YU41135-470	COIL	47μH
L101	YU41135-470	COIL	47μH
L102	YU41135-470	COIL	47μH
L103	YU41135-470	COIL	47μH
L104	YU41135-470	COIL	47μH
L105	YU41135-470	COIL	47μH
L106	YU41135-470	COIL	47μH
L107	YU41135-470	COIL	47μH
L108	YU41135-470	COIL	47μH
L109	YU41135-470	COIL	47μH
L110	PU58201-331J	COIL	330μH
L112	PU58201-220J	COIL	22μH
L113	PU58201-181J	COIL	180μH
L114	PU58201-181J	COIL	180μH
L115	PU53223-820J	COIL	82μH

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
L116	PU53223-120J	COIL	12μH
L117	PU58201-470J	COIL	47μH
L401	YU41135-470	COIL	47μH
L402	YU41135-470	COIL	47μH
L403	PU53223-470J	COIL	47μH
L404	PU55843-150J	COIL	15μH
L406	YU41135-470	COIL	47μH
L410	YU41135-470	COIL	47μH
L411	PU53618-821J	COIL	820μH
L412	PU58201-390J	COIL	39μH
L413	PU58201-221J	COIL	220μH
L414	PU54710-222	COIL	2.2mH
L419	PU54710-822	COIL	8.2mH
EQ2	PGZ01446	EQUALIZER	
	or PGZ01446-R	EQUALIZER	
EQ3	PGZ01445	EQUALIZER	
LPF2	YU40823	LOW PASS FILTER	
	or YU40823-R	LOW PASS FILTER	
LPF3	PELN0320	LOW PASS FILTER	
LPF4	PGZ01447	CHIP LOW PASS FILTER	
	or PGZ01447-R	CHIP LOW PASS FILTER	
LPF401	YU41343	LOW PASS FILTER	
	or YU41343-Z	LOW PASS FILTER	
BPF401	PELN0357	BAND PASS FILTER	
	or PELN0357-P	BAND PASS FILTER	
BPF402	YU40826	BAND PASS FILTER	
	or YU40826-P	BAND PASS FILTER	
CF401	YU40830	CERAMIC FILTER	
DL401	YU41168	2H DELAY LINE	
⚠ X401	YU40829	CRYSTAL RESONATOR	
TH2	YU41252	THERMISTOR	
CL1	YU40245-02	WIRE CLAMP, X3	
J1	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
J2	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
J3	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
J5	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
J6	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
SPC1	YQM30029-25	SPACER	

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
J10	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
J118	QWE212-05A2A2	WIRE	
J119	QWE212-05A2A2	WIRE	
TP1	PGZ01015	CHIP TEST-PIN, (GND1)	
TP2	PGZ01015	CHIP TEST-PIN, (GND2)	
TP3	PGZ01015	CHIP TEST-PIN	
TP3	PU56008	TEST-PIN, X2 (GND3,JIG)	
TP4	PGZ01015	CHIP TEST-PIN	
TP11	PGZ01015	CHIP TEST-PIN	
TP15	PGZ01015	CHIP TEST-PIN	
TP22	PGZ01015	CHIP TEST-PIN	
TP23	PGZ01015	CHIP TEST-PIN	
TP24	PGZ01015	CHIP TEST-PIN	
TP25	PGZ01015	CHIP TEST-PIN	
TP26	PGZ01015	CHIP TEST-PIN	
TP27	PGZ01015	CHIP TEST-PIN	
TP28	PGZ01015	CHIP TEST-PIN	
TP29	PGZ01015	CHIP TEST-PIN	
TP30	PGZ01015	CHIP TEST-PIN	
TP104	PGZ01015	CHIP TEST-PIN	
TP403	PGZ01015	CHIP TEST-PIN	
TP404	PGZ01015	CHIP TEST-PIN	
TP411	PGZ01015	CHIP TEST-PIN	
TP422	PGZ01015	CHIP TEST-PIN	
TP426	PGZ01015	CHIP TEST-PIN	
TP500	PGZ01015	CHIP TEST-PIN	
TP501	PGZ01015	CHIP TEST-PIN	
TP502	PGZ01015	CHIP TEST-PIN	
TP503	PGZ01015	CHIP TEST-PIN	
TP504	PGZ01015	CHIP TEST-PIN	
CN1	YU40678-30	CAP HOUSING,(BOARD TO BOARD)	
CN2	YU40105-16	CAP HOUSING,(BOARD TO BOARD)	
CN3	YU40108-7	CONNECTOR	
CN4	YU40108-15	CONNECTOR	
CN5	YU40108-14	CONNECTOR	

- Y/C BOARD SUB-1 ASSEMBLY -

PWBB1	PRK20094A1	Y/C SUB-1 BOARD ASSY	
D102	MA157	DIODE	
D106	DAN202U	DIODE	

- Y/C BOARD SUB-2 ASSEMBLY -

PWBB2	PRK20094A2	Y/C SUB-2 BOARD ASSY	
C120	NCB31EK-103A	CAPACITOR	0.01μF,25V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	

- Y/C BOARD SUB-3 ASSEMBLY -

PWBB3	PRK20094A3	Y/C SUB-3 BOARD ASSY	
Q200	2SC4081(QRS)	TRANSISTOR	
D107	DAN202U	DIODE	
R601	NRSA63J-181N	RESISTOR	180Ω,1/16W

- Y/C BOARD SUB-4 ASSEMBLY -

PWBB4	PRK20094A4	Y/C SUB-4 BOARD ASSY	
R690	NRSA63J-103N	RESISTOR	10KΩ,1/16W

- Y/C BOARD SUB-5 ASSEMBLY -

PWBB5	PRK20094A5	Y/C SUB-5 BOARD ASSY	
R700	NRSA63J-681N	RESISTOR	680Ω,1/16W

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AUDIO BOARD ASSEMBLY <03>

PWBA	YB10029Y-03-C2	AUDIO BOARD ASSY
IC1	AN3380NK	IC
IC2	TA7361AP	IC
IC3	NJM2904E	IC
	or LM2904E	IC
IC101	AN3977C	IC
IC102	AN3931NC-A	IC
Q1	DTC144EU	TRANSISTOR
Q2	2SC4097(QR)	TRANSISTOR
Q4	2SC4081(RS)	TRANSISTOR
Q5	DTC124EU	TRANSISTOR
Q6	DTC124EU	TRANSISTOR
Q7	DTC124EU	TRANSISTOR
Q8	DTA114EU	TRANSISTOR
Q9	DTA114EU	TRANSISTOR
Q10	DTC124EU	TRANSISTOR
Q11	DTA124EU	TRANSISTOR
Q12	DTC124EU	TRANSISTOR

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	Q13	DTC124EU	TRANSISTOR	
	Q14	DTC124EU	TRANSISTOR	
	Q16	DTA114EU	TRANSISTOR	
	Q17	DTA114EU	TRANSISTOR	
	Q18	DTC144EU	TRANSISTOR	
	Q19	DTC144EU	TRANSISTOR	
	Q20	DTA114EU	TRANSISTOR	
	Q22	DTC143TU	TRANSISTOR	
	Q24	2SC4081(RS)	TRANSISTOR	
	Q26	DTA114EU	TRANSISTOR	
	Q27	DTA114EU	TRANSISTOR	
	Q28	DTC144EU	TRANSISTOR	
	Q29	DTC124EU	TRANSISTOR	
	Q30	2SC4081(RS)	TRANSISTOR	
	Q101	DTC124TU	TRANSISTOR	
	Q102	2SA1576(QRS)	TRANSISTOR	
	Q103	DTC143TU	TRANSISTOR	
	Q104	DTC143TU	TRANSISTOR	
	Q105	DTA124EU	TRANSISTOR	
	D1	DAN202U	DIODE	
	D2	DAN202U	DIODE	
	D3	DAN202U	DIODE	
	D5	DAN202U	DIODE	
	D6	DAN202U	DIODE	
	D7	DAN202U	DIODE	
	D10	DAN202U	DIODE	
	D11	DAN202U	DIODE	
	D12	DAN202U	DIODE	
	D13	DAN202U	DIODE	
	D14	DAN202U	DIODE	
	D15	DAN202U	DIODE	
	D16	DAN202U	DIODE	
	D17	DAN202U	DIODE	
	D18	DAN202U	DIODE	
	D101	DAP202U	DIODE	
	R1	NRSA63J-123N	RESISTOR	12KΩ,1/16W
	R2	NRSA63J-153N	RESISTOR	15KΩ,1/16W
	R3	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R4	NRSA63J-682N	RESISTOR	6.8KΩ,1/16W
	R5	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
	R6	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
	R7	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
⚠	R8	NRSA63J-100N	RESISTOR	10Ω,1/16W
	R9	NVP1301-473N	V RESISTOR, BIAS LEVEL	47KΩ
	R10	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R11	NRSA63J-104N	RESISTOR	100KΩ,1/16W
	R12	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
	R13	NRSA63J-393N	RESISTOR	39KΩ,1/16W
	R14	NRSA63J-4R7N	RESISTOR	4.7Ω,1/16W
	R15	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R16	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W
	R17	NRSA63J-561N	RESISTOR	560Ω,1/16W

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	R18	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
	R19	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R20	NRSA63J-223N	RESISTOR	22KΩ,1/16W
	R21	NRSA63J-121N	RESISTOR	120Ω,1/16W
⚠	R22	NRSA63J-820N	RESISTOR	82Ω,1/16W
	R23	NRSA63J-303N	RESISTOR	30KΩ,1/16W
	R24	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
	R25	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R26	NRSA63J-184N	RESISTOR	180KΩ,1/16W
	R27	NRSA63J-391N	RESISTOR	390Ω,1/16W
	R28	NVP1301-471N	V RESISTOR, N PB LEVEL	470Ω
	R29	NRSA63J-123N	RESISTOR	12KΩ,1/16W
	R30	NRSA63J-563N	RESISTOR	56KΩ,1/16W
	R31	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R32	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R33	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R34	NRSA63J-123N	RESISTOR	12KΩ,1/16W
	R35	NRSA63J-563N	RESISTOR	56KΩ,1/16W
	R36	NRSA63J-223N	RESISTOR	22KΩ,1/16W
	R37	NRSA63J-682N	RESISTOR	6.8KΩ,1/16W
	R38	NRSA63J-223N	RESISTOR	22KΩ,1/16W
	R39	NRSA63J-682N	RESISTOR	6.8KΩ,1/16W
	R40	NVP1301-103N	V RESISTOR, L IND LEVEL	10KΩ
	R41	NVP1301-103N	V RESISTOR, R IND LEVEL	10KΩ
	R42	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
	R43	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R44	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R45	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
	R46	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
	R47	NRSA63J-153N	RESISTOR	15KΩ,1/16W
	R48	NRSA63J-223N	RESISTOR	22KΩ,1/16W
	R49	NRSA63J-274N	RESISTOR	270KΩ,1/16W
	R50	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
	R51	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
	R53	NRSA63J-124N	RESISTOR	120KΩ,1/16W
	R54	NRSA63J-473N	RESISTOR	47KΩ,1/16W
	R56	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
	R57	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
	R58	NRSA63J-333N	RESISTOR	33KΩ,1/16W
	R60	NRSA63J-333N	RESISTOR	33KΩ,1/16W
	R61	NRSA63J-333N	RESISTOR	33KΩ,1/16W
	R62	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W
⚠	R63	NRSA63J-470N	RESISTOR	47Ω,1/16W
	R64	NRSA63J-183N	RESISTOR	18KΩ,1/16W
	R65	NRSA63J-511N	RESISTOR	510Ω,1/16W
	R66	NRSA63J-511N	RESISTOR	510Ω,1/16W
	R67	NRSA63J-103N	RESISTOR	10KΩ,1/16W
	R68	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R69	NVP1301-331N	V RESISTOR, REC FM LEVEL	330Ω
	R70	NRSA63J-273N	RESISTOR	27KΩ,1/16W
	R71	NRSA63J-331N	RESISTOR	330Ω,1/16W
	R72	NRSA63J-121N	RESISTOR	120Ω,1/16W
	R73	NRSA63J-121N	RESISTOR	120Ω,1/16W
	R74	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R75	NRSA63J-102N	RESISTOR	1KΩ,1/16W
	R76	NRSA63J-333N	RESISTOR	33KΩ,1/16W

< 03 >

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R77	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R78	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R79	NRSA63J-511N	RESISTOR	510Ω,1/16W
R80	NRSA63J-151N	RESISTOR	150Ω,1/16W
R81	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R82	NRSA63J-153N	RESISTOR	15KΩ,1/16W
R83	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R84	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R86	NRSA63J-125N	RESISTOR	1.2MΩ,1/16W
R87	NRSA63J-824N	RESISTOR	820KΩ,1/16W
R88	NRSA63J-824N	RESISTOR	820KΩ,1/16W
R89	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R90	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R91	NRSA63J-113N	RESISTOR	11KΩ,1/16W
R92	NRSA63J-113N	RESISTOR	11KΩ,1/16W
R93	NRSA63J-113N	RESISTOR	11KΩ,1/16W
R94	NRSA63J-113N	RESISTOR	11KΩ,1/16W
R95	NRSA63J-113N	RESISTOR	11KΩ,1/16W
R96	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R97	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R98	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R99	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R100	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R101	NRSA63J-105N	RESISTOR	1MΩ,1/16W
R102	NRSA63J-105N	RESISTOR	1MΩ,1/16W
R103	NRSA63J-105N	RESISTOR	1MΩ,1/16W
R104	NRSA63J-511N	RESISTOR	510Ω,1/16W
R105	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R106	NRSA63J-511N	RESISTOR	510Ω,1/16W
R107	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R108	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R109	NRSA63J-243N	RESISTOR	24KΩ,1/16W
R110	NRSA63J-512N	RESISTOR	5.1KΩ,1/16W
R111	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R112	PU57567-12	TRIMMING RESISTOR, L EE LEVEL	
R113	NRSA63J-334N	RESISTOR	330KΩ,1/16W
R114	NRSA63J-334N	RESISTOR	330KΩ,1/16W
R115	PU57567-12	TRIMMING RESISTOR, R EE LEVEL	
R116	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R117	NRSA63J-512N	RESISTOR	5.1KΩ,1/16W
R118	NRSA63J-243N	RESISTOR	24KΩ,1/16W
R119	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R120	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R121	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R123	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R124	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R127	NRSA63J-202N	RESISTOR	2KΩ,1/16W
R128	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R130	PU57567-28	TRIMMING RESISTOR, LIM LEVEL	
R131	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R132	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R133	NRSA63J-202N	RESISTOR	2KΩ,1/16W
R134	NRSA63J-362N	RESISTOR	3.6KΩ,1/16W
R135	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W
R136	PU57567-7	TRIMMING RESISTOR, L REC LEVEL	
R137	NRSA63J-103N	RESISTOR	10KΩ,1/16W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R138	NRSA63J-202N	RESISTOR	2KΩ,1/16W
R139	NRSA63J-362N	RESISTOR	3.6KΩ,1/16W
R140	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W
R141	PU57567-7	TRIMMING RESISTOR, R REC LEVEL	
R142	PU57567-34	TRIMMING RESISTOR, L PB FM LEV	
R143	PU57567-34	TRIMMING RESISTOR, PB FM LEVEL	
R144	PU57567-30	TRIMMING RESISTOR, L FINE CARR	
R145	PU57567-1	TRIMMING RESISTOR, L CARRIER	
R146	PU57567-32	TRIMMING RESISTOR, R FINE CARR	
R147	PU57567-12	TRIMMING RESISTOR, R CARRIER	
R148	PU57567-34	TRIMMING RESISTOR, R PB FM LEV	
R149	PU57567-34	TRIMMING RESISTOR, R PB FM LEV	
R150	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R151	NRSA63J-271N	RESISTOR	270Ω,1/16W
R152	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R153	NRSA63J-823N	RESISTOR	82KΩ,1/16W
R155	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R156	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R157	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R158	NRSA63J-0R0A	RESISTOR	0Ω,1/16W
R159	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R160	NVP1301-222N	V RESISTOR, S REC FM LEVEL	2.2KΩ
R161	NRSA63J-223N	RESISTOR	22KΩ,1/16W
C1	NEH11CM-106N	CHIP.E CAPACITOR	10µF,16V
C2	NEH10JM-226N	CHIP.E CAPACITOR	22µF,6.3V
C3	NEN10JM-106NZ	E CAPACITOR	10µF,6.3V
C4	NEH11CM-106N	CHIP.E CAPACITOR	10µF,16V
C5	NEH10JM-226N	CHIP.E CAPACITOR	22µF,6.3V
C6	NEH10GM-336NZ	CAIP.E CAPACITOR	
C7	QEF81CM-226	TANTAL CAPACITOR	22µF,16V
C8	NCB31HK-102A	CAPACITOR	0.001µF,50V
C9	NCS31HJ-101A	CAPACITOR	100PF,50V
C10	QEF81AM-336	CHIP.T CAPACITOR	33µF,10V
C11	NEH10JM-226N	CHIP.E CAPACITOR	22µF,6.3V
C12	NEH10JM-226N	CHIP.E CAPACITOR	22µF,6.3V
C13	NEH11CM-106N	CHIP.E CAPACITOR	10µF,16V
C14	NEN10JM-106NZ	E CAPACITOR	10µF,6.3V
C15	NEH10JM-226N	CHIP.E CAPACITOR	22µF,6.3V
C16	NEH11CM-106N	CHIP.E CAPACITOR	10µF,16V
C17	NCB31HK-331A	CAPACITOR	330PF,50V
C18	QFZ9011-333	MM CAPACITOR	0.033µF
C19	NCB31HK-561A	CAPACITOR	560PF,50V
C20	NCB31HK-392A	CAPACITOR	0.0039µF,50V
C21	QEF81DM-156	TANTAL CAPACITOR	15µF,20V
C22	NEE21AM-106RY	TANTAL CAPACITOR	10µF,10V
C23	QCDA1EM-273	CAPACITOR	0.027µF,25V
C24	NCS31HJ-221A	CAPACITOR	220PF,50V
C25	QEF81CM-225	TANTAL CAPACITOR	2.2µF,16V
C26	NEH10JM-226N	CHIP.E CAPACITOR	22µF,6.3V
C27	NEH10GM-476NZ	CHIP.E CAPACITOR	47µF,4.0V
C28	QCYA1EK-563	CAPACITOR	0.056µF,25V
C29	QCYA1EK-393	CAPACITOR	0.039µF,25V
C30	NEH11CM-106N	CHIP.E CAPACITOR	10µF,16V
C32	NCB31EK-103A	CAPACITOR	0.01µF,25V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C33	QEF81VM-224	TANTAL CAPACITOR	0.22μF,35V
	C34	NEH11CM-106N	CHIP.E CAPACITOR	10μF,16V
	C35	NEH11HM-105NZ	CHIP.E CAPACITOR	1μF,50V
	C36	NEH11CM-106N	CHIP.E CAPACITOR	10μF,16V
	C37	NEH10JM-226N	CHIP.E CAPACITOR	22μF,6.3V
	C38	QEF81EM-106	TANTAL CAPACITOR	10μF,25V
	C39	NEH10JM-226N	CHIP.E CAPACITOR	22μF,6.3V
	C40	NEH11CM-106N	CHIP.E CAPACITOR	10μF,16V
	C41	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C42	NEH11HM-474NZ	CHIP.E CAPACITOR	0.47μF,50V
	C43	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C44	NEH11HM-474NZ	CHIP.E CAPACITOR	0.47μF,50V
	C45	NEH11HM-474NZ	CHIP.E CAPACITOR	0.47μF,50V
	C46	NEH11HM-474NZ	CHIP.E CAPACITOR	0.47μF,50V
	C47	QEF81CM-225	TANTAL CAPACITOR	2.2μF,16V
	C49	QCYA1EK-223	CHIP.C CAPACITOR	0.022μF,25V
	C50	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C51	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C52	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C53	QCYA1EK-223	CHIP.C CAPACITOR	0.022μF,25V
	C54	NEH10JM-107NP	CHIP.E CAPACITOR	100μF,6.3V
	C55	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C56	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C57	NCS31HJ-330A	CAPACITOR	33PF,50V
	C58	NCB31HK-331A	CAPACITOR	330PF,50V
	C59	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C60	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C61	NCS31HJ-271A	CAPACITOR	270PF,50V
	C62	NCS31HJ-271A	CAPACITOR	270PF,50V
	C63	NCB31HK-332A	CAPACITOR	0.0033μF,50V
	C64	QEF81EM-106	TANTAL CAPACITOR	10μF,25V
	C65	QEF81EM-106	TANTAL CAPACITOR	10μF,25V
	C67	NEH11CM-106N	CHIP.E CAPACITOR	10μF,16V
	C68	QEF81VM-105	TANTAL CAPACITOR	1μF,35V
	C70	QCFA1EZ-473	CHIP.C CAPACITOR	0.047μF,25V
	C71	QCFA1EZ-473	CHIP.C CAPACITOR	0.047μF,25V
	C72	NCB31HK-561A	CAPACITOR	560PF,50V
	C73	NCB31HK-561A	CAPACITOR	560PF,50V
	C77	QEF81EM-106	TANTAL CAPACITOR	10μF,25V
	C78	NCB31EK-822A	CAPACITOR	0.0082μF,25V
	C79	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C80	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C81	NEN11EM-225NZ	E CAPACITOR	2.2μF,25V
	C86	NEH10GM-476NZ	CHIP.E CAPACITOR	47μF,4.0V
	C87	NEH10GM-336NZ	CAIP.E CAPACITOR	
	C88	NEH10GM-336NZ	CAIP.E CAPACITOR	
	C89	NCB31HK-332A	CAPACITOR	0.0033μF,50V
	C90	NCB31HK-332A	CAPACITOR	0.0033μF,50V
	C91	NCB31HK-392A	CAPACITOR	0.0039μF,50V
	C92	NCB31EK-472A	CAPACITOR	0.0047μF,25V
	C93	NCB31HK-272A	CAPACITOR	0.0027μF,50V
	C94	NCB31HK-471A	CAPACITOR	470PF,50V
	C95	NCS31HJ-181A	CAPACITOR	180PF,50V
	C96	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C101	NCB31HK-472A	CAPACITOR	0.0047μF,50V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C102	NCB31HK-472A	CAPACITOR	0.0047μF,50V
	C103	NCS31HJ-330A	CAPACITOR	33PF,50V
	C104	QCF81CZ-474	E CAPACITOR	0.47μF,16V
	C105	QCFA1EZ-473	CHIP.C CAPACITOR	0.047μF,25V
	C106	QCFA1EZ-473	CHIP.C CAPACITOR	0.047μF,25V
	C107	QCYA1HK-153	CHIP.C CAPACITOR	0.015μF,50V
	C109	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C110	QCFA1EZ-473	CHIP.C CAPACITOR	0.047μF,25V
	C111	QCFA1EZ-473	CHIP.C CAPACITOR	0.047μF,25V
	C112	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C114	QCYA1HK-153	CHIP.C CAPACITOR	0.015μF,50V
	C115	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C116	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C117	QCF81CZ-105	CAPACITOR	1μF,16V
	C118	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C119	NCB31EK-822A	CAPACITOR	0.0082μF,25V
	C120	QCF81EZ-224ZLM	CAPACITOR	0.22μF,25V
	C121	NCS31HJ-101A	CAPACITOR	100PF,50V
	C122	NCB31HK-561A	CAPACITOR	560PF,50V
	C123	QCF81EZ-224ZLM	CAPACITOR	0.22μF,25V
	C124	NCB31EK-822A	CAPACITOR	0.0082μF,25V
	C125	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C126	QCF81CZ-105	CAPACITOR	1μF,16V
	C127	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C128	NCB31HK-471A	CAPACITOR	470PF,50V
	C129	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C130	QCF81CZ-105	CAPACITOR	1μF,16V
	C131	NCB31HK-392A	CAPACITOR	0.0039μF,50V
	C132	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C133	NCB31HK-471A	CAPACITOR	470PF,50V
	C134	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C135	QCF81CZ-105	CAPACITOR	1μF,16V
	C136	NCB31HK-392A	CAPACITOR	0.0039μF,50V
	C137	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C138	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF,25V
	C139	QCF81CZ-105	CAPACITOR	1μF,16V
	C140	QCF81CZ-105	CAPACITOR	1μF,16V
	L1	PELN0325-101KZ	COIL	
	L2	PELN0325-101KZ	COIL	
	L3	PU53607-472	COIL	4.7mH
	L4	PELN0325-221KZ	COIL	
	L5	PELN0325-101KZ	COIL	
⚠	L7	YU40932-P	OSC COIL	
	BPF1	YU41191-P	BPF(1.4M)	
	BPF2	YU41192-P	BPF(1.8M)	
	SLD1	YU41257	SHIELD CASE	
	SLD2	YU41317A	SHIELD PLATE ASSY	
	SLD3	YU41258	SHIELD PLATE	
	SLD4	YU41316	INSULATOR	
	SLD5	YU41338	SHIELD PLATE	
	SLD6	YU41308	SHIELD CAP	

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
TP1	YU40581	TEST PIN	
TP2	YU40581	TEST PIN	
TP3	YU40581	TEST PIN	
TP4	YU40581	TEST PIN	
TP5	YU40581	TEST PIN	
TP6	YU40581	TEST PIN	
TP7	YU40581	TEST PIN	
TP8	YU40581	TEST PIN	
TP9	YU40581	TEST PIN	
TP10	YU40581	TEST PIN	
TP11	YU40581	TEST PIN	
TP12	YU40581	TEST PIN	
TP13	YU40581	TEST PIN	
TP14	YU40581	TEST PIN	
TP15	YU40581	TEST PIN	
TP16	YU40581	TEST PIN	
TP17	YU40581	TEST PIN	
TP18	YU40581	TEST PIN	
TP19	YU40581	TEST PIN	
TP20	YU40581	TEST PIN	
CN1	YU40105-26	CONNECTOR	
CN2	YU40108-4	CONNECTOR	
CN3	YU40108-13	CONNECTOR	
CN4	YU40096-5Y	CONNECTOR	
CN5	YU40108-9	CONNECTOR	

– PLOT/EP S/N BOARD ASSEMBLY –

PWBA	YB20282A	PROT/EP S/N BOARD ASSY	
Q21	DTC144EU	TRANSISTOR	
Q23	DTC144EU	TRANSISTOR	
D8	DAP202U	DIODE	
R162	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R163	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W

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PRE AMP BOARD ASSEMBLY <04>

PWBA	YB20168A-02	PRE AMP BOARD ASSY	
IC1	TA8609F	IC	
IC2	5VT51	IC	

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
Q1	2SC3936(BC)	TRANSISTOR	
Q2	2SC3936(BC)	TRANSISTOR	
Q3	2SC4116(YGL)	TRANSISTOR	
Q4	2SC4116(YGL)	TRANSISTOR	
Q5	2SC4116(YGL)	TRANSISTOR	
Q6	2SC4116(YGL)	TRANSISTOR	
Q7	2SC4116(YGL)	TRANSISTOR	
Q8	2SC4116(YGL)	TRANSISTOR	
Q9	2SC4081(QRS)	TRANSISTOR	
Q10	2SA1577(PQ)	TRANSISTOR	
Q11	2SC4081(QRS)	TRANSISTOR	
Q12	2SC4081(QRS)	TRANSISTOR	
Q13	DTC144EU	TRANSISTOR	
Q14	2SA1577(PQ)	TRANSISTOR	
Q15	DTC144EU	TRANSISTOR	
Q16	DTC144EU	TRANSISTOR	
D1	DAP202U	DIODE	
	or MA141WA	DIODE	
D2	DAP202U	DIODE	
	or MA141WA	DIODE	
D3	DAN202U	DIODE	
	or MA141WK	DIODE	
D4	DAN202U	DIODE	
	or MA141WK	DIODE	
R1	NRSA63J-680N	RESISTOR	68Ω,1/16W
R2	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R3	NRSA63J-100N	RESISTOR	10Ω,1/16W
R4	NVP1301-471N	V RESISTOR, SP CH2 Q	470Ω
R5	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R6	NVP1301-471N	V RESISTOR, LP CH1 Q	470Ω
R7	NRSA63J-100N	RESISTOR	10Ω,1/16W
R8	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R9	NRSA63J-680N	RESISTOR	68Ω,1/16W
R10	NVP1301-471N	V RESISTOR, LP CH2 Q	470Ω
R11	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R12	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R13	NVP1301-471N	V RESISTOR, SP CH1 Q	470Ω
R14	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R15	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R16	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R17	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R18	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R19	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R20	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R21	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R22	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R23	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R24	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R25	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R26	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R27	NRSA63J-102N	RESISTOR	1KΩ,1/16W
C1	QEF81CM-105	TANTAL CAPACITOR	1μF,16V
C2	QEF81CM-105	TANTAL CAPACITOR	1μF,16V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C3	NCB31EK-103A	CAPACITOR	0.01μF,25V
C4	QER40JM-476	E CAPACITOR	47μF,6.3V
C5	QEF81CM-105	TANTAL CAPACITOR	1μF,16V
C6	NCS31HJ-101A	CAPACITOR	100PF,50V
C7	QEF81CM-105	TANTAL CAPACITOR	1μF,16V
C8	QEF81CM-105	TANTAL CAPACITOR	1μF,16V
C9	NCB31EK-103A	CAPACITOR	0.01μF,25V
C10	NCB31EK-103A	CAPACITOR	0.01μF,25V
C11	QEF81CM-105	TANTAL CAPACITOR	1μF,16V
C12	NCB31EK-103A	CAPACITOR	0.01μF,25V
C13	NCB31EK-103A	CAPACITOR	0.01μF,25V
C14	NCB31EK-103A	CAPACITOR	0.01μF,25V
C15	PU56274-200	TRIMMER CAPACITOR, SP CH1 F0	20PF
C16	PU56274-200	TRIMMER CAPACITOR, SP CH2 F0	20PF
C17	NCB31EK-103A	CAPACITOR	0.01μF,25V
C18	PU56274-200	TRIMMER CAPACITOR, LP CH1 F0	20PF
C19	NCB31EK-103A	CAPACITOR	0.01μF,25V
C20	PU56274-200	TRIMMER CAPACITOR, LP CH2 F0	20PF
C21	NCB31EK-103A	CAPACITOR	0.01μF,25V
C22	NCB31EK-103A	CAPACITOR	0.01μF,25V
C23	NCB31EK-103A	CAPACITOR	0.01μF,25V
C24	NCB31EK-103A	CAPACITOR	0.01μF,25V
C25	NCB31EK-103A	CAPACITOR	0.01μF,25V
C26	NCB31EK-103A	CAPACITOR	0.01μF,25V
C27	NCB31HK-271A	CAPACITOR	270PF,50V
C28	QEE81AM-106	CAPACITOR	10μF,10V
C29	NCB31EK-103A	CAPACITOR	0.01μF,25V
L1	YU41135-101KY	COIL	100μH
L2	YU41135-100KY	COIL	10μH
L4	PU58201-1R2K	COIL	1.2μH
T1	PU56175	S.TRANS	
CN1	YU40593-15	HOUSING	

6.5 IF board assembly 0 6

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Symbol No.	Part No.	Part Name	Description
PWBA		PRK20081B	IF BOARD ASSY
IC1	NJM2068MD	IC	
IC2	NJM4556MB	IC	
IC3	M5201FP	IC	
IC4	M5241L	IC	
IC5	NJM4556MB	IC	
IC6	MN4021BS	IC	
IC7	BA6993F	IC	
IC8	BA6993F	IC	
IC9	TC4050BF	IC	
IC10	TK15021	IC	
IC11	NJM2068MD	IC	
IC12	NJM4556MB	IC	
IC13	NJM4556MB	IC	
IC14	TA78L08F	IC	
IC15	TA78L08F	IC	
Q1	2SD601	TRANSISTOR	
Q2	2SD601	TRANSISTOR	
Q3	FMW3	TRANSISTOR	
Q4	2SB710(Q.R)TX	TRANSISTOR	
Q5	2SC2295(B.C)TX	TRANSISTOR	
Q6	2SC2295(B.C)TX	TRANSISTOR	
Q7	2SC2295(B.C)TX	TRANSISTOR	
Q8	2SC2295(B.C)TX	TRANSISTOR	
Q9	2SD602(QR)	TRANSISTOR	
Q10	2SC2295(B.C)TX	TRANSISTOR	
Q11	2SC2295(B.C)TX	TRANSISTOR	
Q12	2SC2295(B.C)TX	TRANSISTOR	
Q13	2SD602(QR)	TRANSISTOR	
Q14	2SD602(QR)	TRANSISTOR	
Q15	2SC2295(B.C)TX	TRANSISTOR	
Q16	2SC2295(B.C)TX	TRANSISTOR	
Q17	2SC2295(B.C)TX	TRANSISTOR	
Q18	2SD602(QR)	TRANSISTOR	
Q19	2SD602(QR)	TRANSISTOR	
Q20	2SC2295(B.C)TX	TRANSISTOR	
Q21	DTC124EK	TRANSISTOR	
Q22	2SD601	TRANSISTOR	
Q23	DTC124EK	TRANSISTOR	
D1	DA204K	DIODE	
D2	HZM6CTR	ZENER DIODE	
D3	HZM6CTR	ZENER DIODE	
D4	DA204K	DIODE	
D5	DA204K	DIODE	
D6	DA204K	DIODE	
D7	DA204K	DIODE	
R1	QRSA08J-681YN	RESISTOR	680Ω 1/10W
R2	QRSA08J-473YN	RESISTOR	47KΩ 1/10W
R3	QRSA08J-473YN	RESISTOR	47KΩ 1/10W
R4	QRSA08J-332YN	RESISTOR	3.3KΩ 1/10W
R5	QRSA08J-332YN	RESISTOR	3.3KΩ 1/10W
R6	QRSA08J-473YN	RESISTOR	47KΩ 1/10W
R7	QRSA08J-472YN	RESISTOR	4.7KΩ 1/10W
R8	QRSA08J-472YN	RESISTOR	4.7KΩ 1/10W

Symbol No.	Part No.	Part Name	Description	
R9	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
VR1	YU41218-102NZ	V RESISTOR		
VR3	YU41218-102NZ	V RESISTOR		
R10	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R11	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R12	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R13	QRSA08J-563YN	RESISTOR	56KΩ	1/10W
R14	QRSA08J-563YN	RESISTOR	56KΩ	1/10W
R15	QRSA08J-681YN	RESISTOR	680Ω	1/10W
R16	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R17	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R18	QRSA08J-332YN	RESISTOR	3.3KΩ	1/10W
R19	QRSA08J-332YN	RESISTOR	3.3KΩ	1/10W
R20	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R21	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R22	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R23	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R24	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R25	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R26	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R27	QRSA08J-153YN	RESISTOR	15KΩ	1/10W
R28	QRSA08J-471YN	RESISTOR	470Ω	1/10W
R29	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R30	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R31	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R32	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R33	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R34	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R35	QRSA08J-182YN	RESISTOR	1.8KΩ	1/10W
R36	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R37	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R38	QRSA08J-224YN	RESISTOR	220KΩ	1/10W
R39	QRSA08J-224YN	RESISTOR	220KΩ	1/10W
R40	QRSA08J-333YN	RESISTOR	33KΩ	1/10W
R41	QRSA08J-104YN	RESISTOR	100KΩ	1/10W
R42	QRSA08J-104YN	RESISTOR	100KΩ	1/10W
R43	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R44	QRSA08J-682YN	RESISTOR	6.8KΩ	1/10W
R45	QRSA08J-104YN	RESISTOR	100KΩ	1/10W
R46	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R47	QRSA08J-333YN	RESISTOR	33KΩ	1/10W
R48	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R49	QRSA08J-393YN	RESISTOR	39KΩ	1/10W
R50	QRSA08J-123YN	RESISTOR	12KΩ	1/10W
R51	QRSA08J-123YN	RESISTOR	12KΩ	1/10W
R52	QRSA08J-273YN	RESISTOR	27KΩ	1/10W
R53	QRSA08J-153YN	RESISTOR	15KΩ	1/10W
R54	QRSA08J-822YN	RESISTOR	8.2KΩ	1/10W
R55	QRSA08J-333YN	RESISTOR	33KΩ	1/10W
R60	QRSA08J-101YN	RESISTOR	100Ω	1/10W
R62	QRSA08J-273YN	RESISTOR	27KΩ	1/10W
R63	QRSA08J-153YN	RESISTOR	15KΩ	1/10W
R64	QRSA08J-391YN	RESISTOR	390Ω	1/10W
R65	QRSA08J-331YN	RESISTOR	330Ω	1/10W
⚠ R66	QRSA08J-680YN	RESISTOR	68Ω	1/10W
R67	QRSA08J-182YN	RESISTOR	1.8KΩ	1/10W

Symbol No.	Part No.	Part Name	Description	
R68	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R69	QRSA08J-273YN	RESISTOR	27KΩ	1/10W
R70	QRSA08J-153YN	RESISTOR	15KΩ	1/10W
R71	QRSA08J-101YN	RESISTOR	100Ω	1/10W
R72	QRSA08J-153YN	RESISTOR	15KΩ	1/10W
R73	QRSA08J-393YN	RESISTOR	39KΩ	1/10W
R74	QRSA08J-681YN	RESISTOR	680Ω	1/10W
R75	QRSA08J-101YN	RESISTOR	100Ω	1/10W
R76	QRSA08J-0R0Y	RESISTOR	0Ω	1/10W
R77	QRSA08J-183YN	RESISTOR	18KΩ	1/10W
R78	QRSA08J-223YN	RESISTOR	22KΩ	1/10W
R79	QRSA08J-561YN	RESISTOR	560Ω	1/10W
R80	QRSA08J-471YN	RESISTOR	470Ω	1/10W
R81	QRSA08J-821YN	RESISTOR	820Ω	1/10W
R82	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R83	QRSA08J-182YN	RESISTOR	1.8KΩ	1/10W
R84	QRSA08J-822YN	RESISTOR	8.2KΩ	1/10W
R85	QRSA08J-123YN	RESISTOR	12KΩ	1/10W
R86	QRSA08J-472YN	RESISTOR	4.7KΩ	1/10W
R87	QRSA08J-392YN	RESISTOR	3.9KΩ	1/10W
R88	QRSA08J-392YN	RESISTOR	3.9KΩ	1/10W
⚠ R89	QRSA08J-680YN	RESISTOR	68Ω	1/10W
⚠ R90	QRSA08J-680YN	RESISTOR	68Ω	1/10W
R91	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
⚠ R92	QRSA08J-750YN	RESISTOR	75Ω	1/10W
R93	QRSA08J-821YN	RESISTOR	820Ω	1/10W
R94	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R95	QRSA08J-101YN	RESISTOR	100Ω	1/10W
R96	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R97	QRSA08J-822YN	RESISTOR	8.2KΩ	1/10W
R98	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R99	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R100	QRSA08J-822YN	RESISTOR	8.2KΩ	1/10W
⚠ R101	QRSA08J-100YN	RESISTOR	10Ω	1/10W
R102	QRSA08J-392YN	RESISTOR	3.9KΩ	1/10W
R103	QRSA08J-392YN	RESISTOR	3.9KΩ	1/10W
⚠ R104	QRSA08J-680YN	RESISTOR	68Ω	1/10W
⚠ R105	QRSA08J-680YN	RESISTOR	68Ω	1/10W
R106	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
⚠ R107	QRSA08J-750YN	RESISTOR	75Ω	1/10W
R108	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R110	QRSA08J-104YN	RESISTOR	100KΩ	1/10W
R111	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R113	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R114	QRSA08J-333YN	RESISTOR	33KΩ	1/10W
R115	QRSA08J-681YN	RESISTOR	680Ω	1/10W
R116	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R117	QRSA08J-682YN	RESISTOR	6.8KΩ	1/10W
R118	QRSA08J-104YN	RESISTOR	100KΩ	1/10W
R119	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
⚠ R120	QRSA08J-270YN	RESISTOR	27Ω	1/10W
⚠ R121	QRSA08J-470YN	RESISTOR	47Ω	1/10W
R122	QRSA08J-393YN	RESISTOR	39KΩ	1/10W
R123	QRSA08J-393YN	RESISTOR	39KΩ	1/10W
R131	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R132	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R133	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R134	QRSA08J-102YN	RESISTOR	1KΩ	1/10W

Symbol No.	Part No.	Part Name	Description	
R135	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R136	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
R137	QRSA08J-822YN	RESISTOR	8.2KΩ	1/10W
R138	QRSA08J-822YN	RESISTOR	8.2KΩ	1/10W
R139	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R140	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R141	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R142	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R143	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
⚠ R144	QRSA08J-100YN	RESISTOR	10Ω	1/10W
R145	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R146	QRSA08J-223YN	RESISTOR	22KΩ	1/10W
R147	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R148	QRSA08J-122YN	RESISTOR	1.2KΩ	1/10W
R150	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R151	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R152	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R153	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R154	QRSA08J-104YN	RESISTOR	100KΩ	1/10W
R155	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R156	QRSA08J-102YN	RESISTOR	1KΩ	1/10W
⚠ R157	QRSA08J-100YN	RESISTOR	10Ω	1/10W
R158	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R159	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R160	QRSA08J-473YN	RESISTOR	47KΩ	1/10W
R161	QRSA08J-0R0Y	RESISTOR	0Ω	1/10W
R163	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R164	QRSA08J-101YN	RESISTOR	100Ω	1/10W
R165	ERT-D2FGL301S	THERMISTOR		
R166	QRSA08J-222YN	RESISTOR	2.2KΩ	1/10W
R167	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R168	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R169	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R170	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R171	QRSA08J-123YN	RESISTOR	12KΩ	1/10W
R172	QRSA08J-122YN	RESISTOR	1.2KΩ	1/10W
R173	QRSA08J-123YN	RESISTOR	12KΩ	1/10W
R174	QRSA08J-122YN	RESISTOR	1.2KΩ	1/10W
R175	QRSA08J-103YN	RESISTOR	10KΩ	1/10W
R176	QRSA08J-0R0Y	RESISTOR	0Ω	1/10W
C1	QCYA1HK-222	CHIP.C CAPACITOR	0.0022μF	50V
C2	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C3	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C4	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C5	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C6	QCYA1HK-222	CHIP.C CAPACITOR	0.0022μF	50V
C7	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C8	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C9	QCYA1HK-102	CHIP.C CAPACITOR	0.001μF	50V
C10	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C11	NEN10JM-106NZ	E CAPACITOR	10μF	6.3V
C12	NEN10JM-106NZ	E CAPACITOR	10μF	6.3V
C13	NEN11EM-225NZ	E CAPACITOR	2.2μF	25V
C14	NEN11EM-225NZ	E CAPACITOR	2.2μF	25V
C15	NEH10JM-107NZ	CHIP.E CAPACITOR	100μF	6.3V
C16	NEE20JM-475RS	CHIP.E CAPACITOR	4.7μF	6.3V
C17	NEE20JM-475RS	CHIP.E CAPACITOR	4.7μF	6.3V
C18	NEH10JM-107NZ	CHIP.E CAPACITOR	100μF	6.3V

Symbol No.	Part No.	Part Name	Description	
C19	NEE21CM-105RS	CHIP.E CAPACITOR	1μF	16V
C20	NEE21CM-105RS	CHIP.E CAPACITOR	1μF	16V
C21	NEE20JM-475RS	CHIP.E CAPACITOR	4.7μF	6.3V
C22	NEE20JM-475RS	CHIP.E CAPACITOR	4.7μF	6.3V
C23	QCYA1HK-222	CHIP.C CAPACITOR	0.0022μF	50V
C24	QCYA1HK-222	CHIP.C CAPACITOR	0.0022μF	50V
C27	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C28	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF	25V
C29	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C30	QCFA1EZ-104	CHIP.C CAPACITOR	0.1μF	25V
C31	NEH11CM-476NP	CHIP.E CAPACITOR	47μF	16V
C33	NEH11EM-106NZ	CHIP.E CAPACITOR	10μF	25V
C34	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C35	QCYA1HK-223	CHIP.C CAPACITOR	0.022μF	50V
C36	NEH11EM-106NZ	CHIP.E CAPACITOR	10μF	25V
C37	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C38	NEH10GM-227NP	CHIP.E CAPACITOR	220μF	4.0V
C39	NEH11HM-105NZ	CHIP.E CAPACITOR	1μF	50V
C40	NEH11EM-106NZ	CHIP.E CAPACITOR	10μF	25V
C41	NEH10GM-227NP	CHIP.E CAPACITOR	220μF	4.0V
C42	NEH11HM-105NZ	CHIP.E CAPACITOR	1μF	50V
C46	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C47	NEH11EM-106NZ	CHIP.E CAPACITOR	10μF	25V
C51	QCYA1HK-223	CHIP.C CAPACITOR	0.022μF	50V
C52	QCYA1HK-223	CHIP.C CAPACITOR	0.022μF	50V
C53	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C54	NEE21CM-225RS	CHIP.E CAPACITOR	2.2μF	16V
C55	NEE20JM-156RY	CHIP.E CAPACITOR	15μF	6.3V
C56	QCSA1HJ-221	CHIP.C CAPACITOR	220PF	50V
C57	NEE20JM-475RS	CHIP.E CAPACITOR	4.7μF	6.3V
C58	QCYA1EK-473	CHIP.C CAPACITOR	0.047μF	25V
C59	NEE20JM-156RY	CHIP.E CAPACITOR	15μF	6.3V
C61	QCYA1HK-333	CHIP.C CAPACITOR	0.033μF	50V
C62	NEH11AM-336NZ	CHIP.E CAPACITOR	33μF	10V
C63	NEH11CM-106N	CHIP.E CAPACITOR	10μF	16V
C64	NEH11CM-476NP	CHIP.E CAPACITOR	47μF	16V
C65	NEH11CM-476NP	CHIP.E CAPACITOR	47μF	16V
C66	NEH11CM-476NP	CHIP.E CAPACITOR	47μF	16V
C67	NEH11CM-476NP	CHIP.E CAPACITOR	47μF	16V
C68	NEH11CM-476NP	CHIP.E CAPACITOR	47μF	16V
C71	QCYA1HK-102	CHIP.C CAPACITOR	0.001μF	50V
C72	QCYA1HK-102	CHIP.C CAPACITOR	0.001μF	50V
C73	QCYA1HK-102	CHIP.C CAPACITOR	0.001μF	50V
C74	QCYA1HK-102	CHIP.C CAPACITOR	0.001μF	50V
C80	QCSA1HJ-560	CHIP.C CAPACITOR	56PF	50V
L1	YU41134-221JY	COIL	220μH	
L2	YU41134-221JY	COIL	220μH	
L3	YU41134-221JY	COIL	220μH	
L4	YU41134-221JY	COIL	220μH	
S1	SCV1757-002	SLIDE SWITCH		
J1	QWE211-04A1A1	WIRE		

Symbol No.	Part No.	Part Name	Description
TP1	PGZ01015	CHIP TEST-PIN, X10	
TP4	PGZ01434	TEST-PIN, X2	
CN2	SSV1321-014	CONNECTOR	
CN3	SSV1321-013	CONNECTOR	
CN5	SSV1321-006	CONNECTOR	
CN7	ML-G00848A	IF WIRE	
CN8	SCV1770-009	SMT CONNECTOR	
CN9	SCV1770-010	SMT CONNECTOR	
CN10	SSV1321-014	CONNECTOR	
CN18	SCV1770-012	SMT CONNECTOR	
CN35	SCV1770-006	SMT CONNECTOR	
CN48	SCV1770-002	SMT CONNECTOR	

#⚠ REF No. PART No. PART NAME, DESCRIPTION

****

UPPER DRUM BOARD <30>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWBA	PDM4271A	UPPER DRUM BOARD ASSY

****

SENSOR BOARD ASSEMBLY <33>

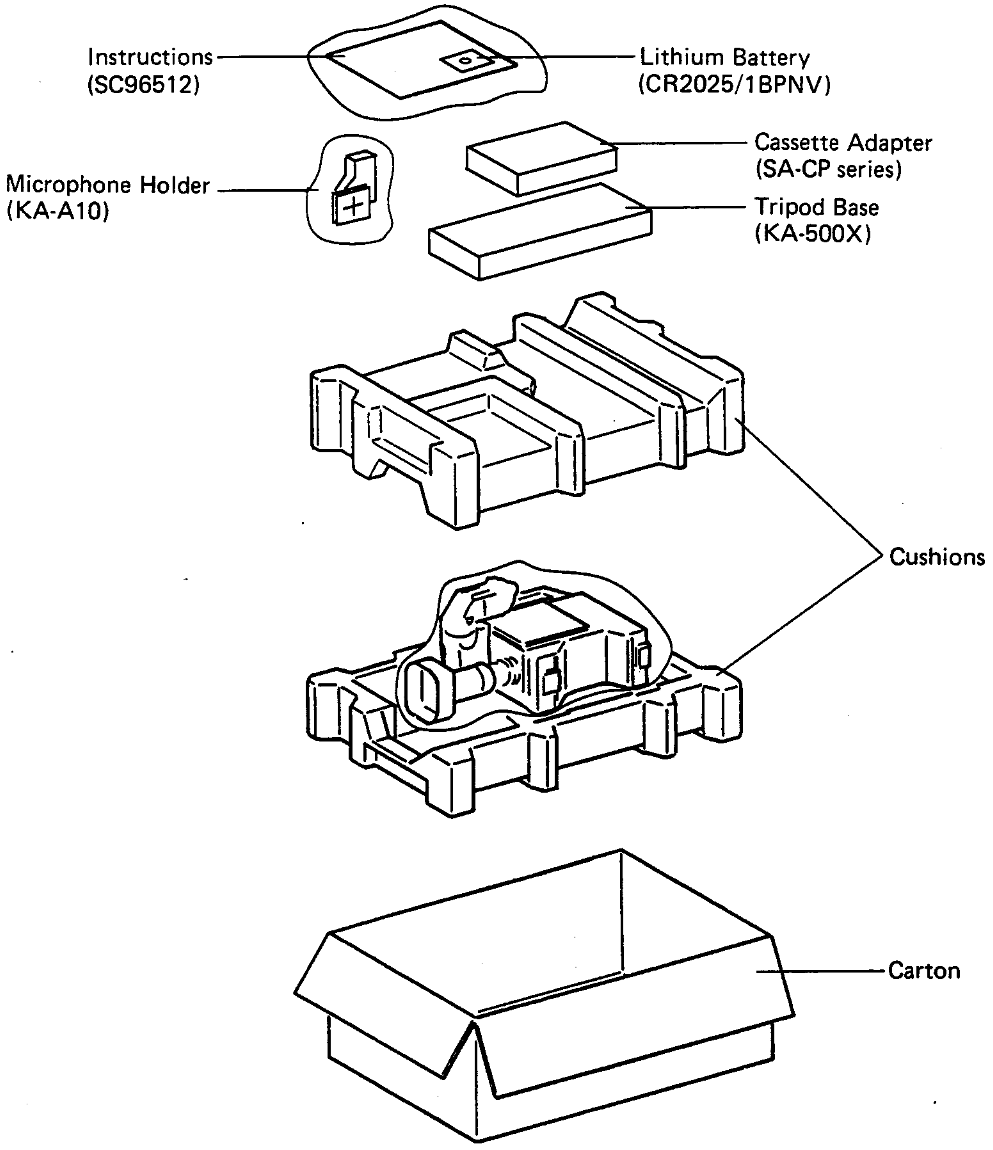
#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWBA	YQ41188A-5	END SENSOR BOARD ASSY
Q1	TPS605	PHOTO TRANSISTOR, X2 (Q1,Q2)
PHS1	TLP907	PHOTO SENSOR
SPC1	YQ41424	SENSOR MASK
SPC2	YQ41725	MASK SHEET
CN1	YU40102-8	CHIP CONNECTOR

****

LED BOARD ASSEMBLY <34>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWBA	YQ41189A-2	LED BOARD ASSY
D1	TLR121	LE DIODE, X2 (D1,D2)
CN1	YU40105-8	CAP HOUSING,(BOARD TO BOARD)

SECTION 4
REPACKING


Instructions
(SC96512)
Lithium Battery
(CR2025/1BPNV)
Microphone Holder
(KA-A10)
Cassette Adapter
(SA-CP series)
Tripod Base
(KA-500X)
Cushions
Carton

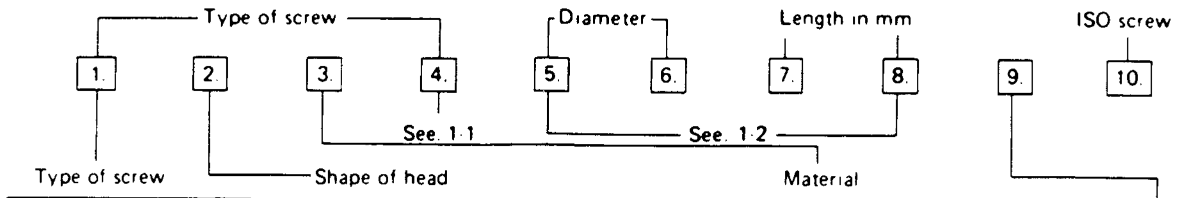
- Some units other than the camera head may be optional depending on the configuration.

SECTION 5
EXPLODED VIEW AND PARTS LIST

Note: Replacing marked ⚠ parts, be sure to use parts specified for safety purposes.
In this exploded views the part number of the screws and washers designate the type and dimensions of those ite
The following examples will help you to decipher them.

5.1 STANDARD PART NUMBER CODING

5.1.1 Screw coding


Type of screw
Diameter
Length in mm
ISO screw
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
See. 1·1
See. 1·2
Type of screw
Shape of head
Material

Type of screw

S	Normal screw
N	Assembly screw
L	"
D	"
G	"
M	W. Wood screw
F	Feather screw
T	Setscrew
Y	"
B	Bolt
N	Nut
W	Washer
R	E-ring
E	—
P	Spring

Shape of head

P		Pan head
S		Flat countersunk head
H		Oval countersunk head
D		Binding head
R		Round head
B		Round head
T		Truss head

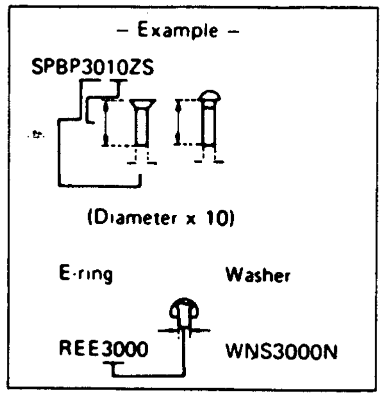
Material

Symbol letter	Material
S	Steel
E	Stainless steel
C	Cast iron
U	Bronze
B	Brass
P	Phosphor bronze
N	German silver
Y	Brass
A	Aluminum
Z	Zinc-alloy
K	Polycarbonate

1·1 Type of screw

P	Cross-Recessed head screw
A	Tapping screw
B	Tapping screw
T	Tapping screw
E	Tapping screw

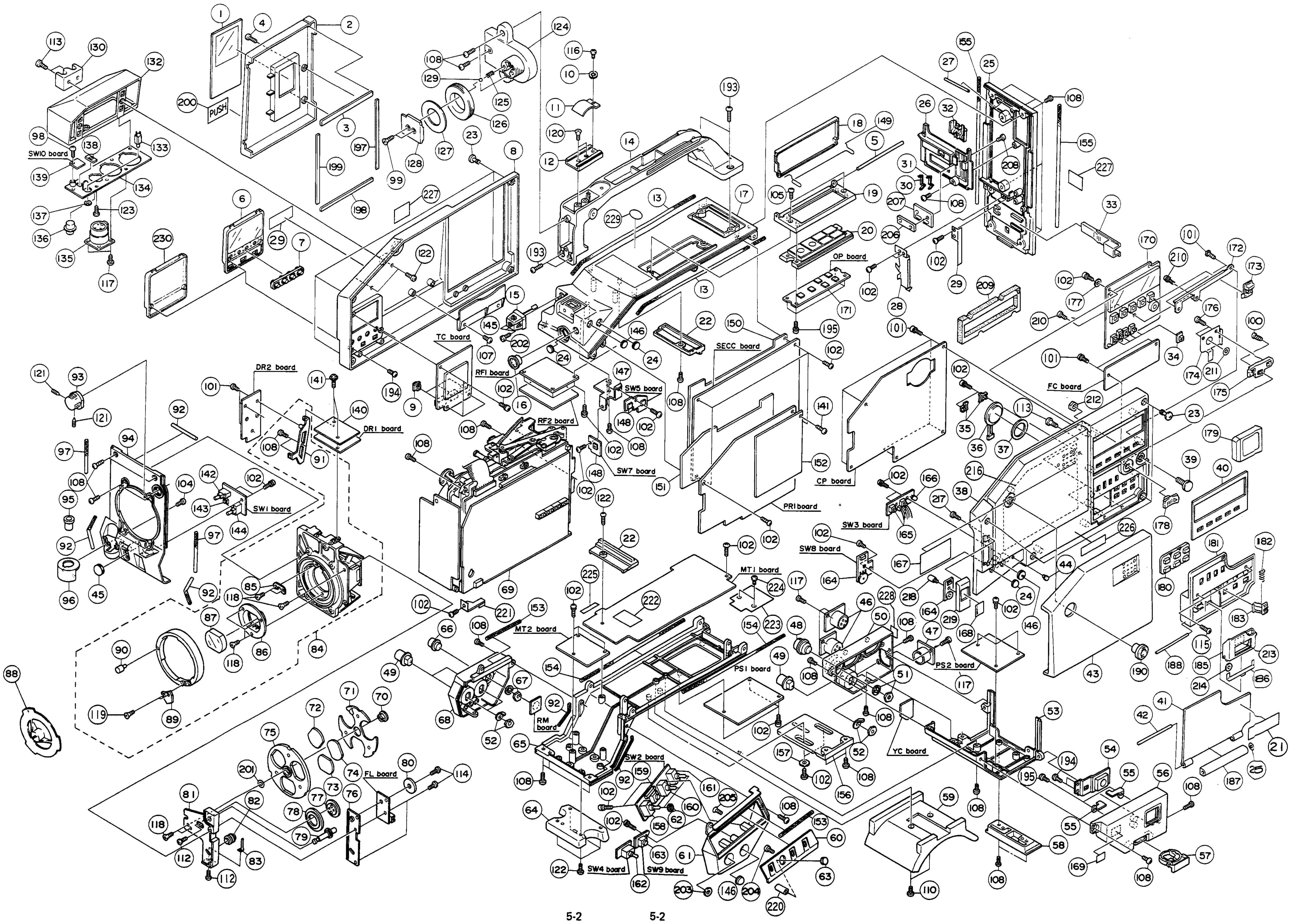
1·2 Diameter and Length of screw


– Example –
SPBP3010ZS
(Diameter x 10)
E-ring
Washer
REE3000
WNS3000N

Surface treatment

Symbol letter	Surface treatment
Z	Galvanization, dichromic acid treatment (MFZn2-C)
N	Nickel plating (MFNi2, MFNi1)
R	Chrome plating (MBCr2, MBCr1)
G	Silver plating (SP4)
W	Nichrome platings
P	Phosphite treatment
B	Bronze plating
M	Black coloring after galvanization
A	Red coloring after galvanization
C	Blue coloring after galvanization
T	Green coloring after galvanization
V	Violet coloring after galvanization
F	Iron with black coloring

5.2 CAMERA HEAD SECTION ASSEMBLY


PUSH
SW10 board
TC board
DR2 board
DR1 board
RF1 board
RF2 board
SW5 board
SW7 board
SW1 board
SECC board
OP board
CP board
PRI board
FC board
SW3 board
SW8 board
MT1 board
MT2 board
RM board
PS1 board
PS2 board
YC board
FL board
SW2 board
SW4 board
SW9 board
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